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In 1963, the National Commission on Community Health Services appointed the Task Force on Health Manpower to assess community health needs, to evaluate methods of recruiting, educating, developing, motivating and utilizing manpower, and to recommend ways to assure availability and optimal utilization of manpower based upon community health needs. Twenty-three recommendations of the task force include: (1) governmental initiative in cooperative planning among governmental and voluntary agencies, (2) innovations to increase productivity of highly skilled personnel, (3) assumption of responsibility by the Public Health Service for collecting and reporting manpower data on a nationwide basis, (4) increasing the numbers of existing and new kinds of allied and auxiliary personnel and expanding and developing their roles, (5) establishing national minimum requirements for the licensure of health personnel, (6) recruiting from groups which have not been fully tapped such as minority groups and technologically displaced workers, (7) expanding health occupations programs in 2-year colleges, (8) emphasizing the preparation of personnel qualified in administration in schools of public health, and (9) augmenting federal support to stimulate funding from other sources, including the private sector. (JK)

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Health Manpower

ACTION TO MEET COMMUNITY NEEDS

National Commission on Community Health Services

Report of the Task Force on Health Manpower

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Public Affairs Press, Washington, D. C.

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NATIONAL TASK FORCES PROJECT

3

NATIONAL COMMISSION ON COMMUNITY
HEALTH SERVICES.

REPORT OF THE TASK FORCE ON
HEALTH MANPOWER.

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION

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Foreword

In presenting this report of the Task Force on Health Manpower, Dr. Lenor S. Goerke, Task Force Chairman, said to Marion B. Folsom, Chairman of the National Commission on Community Health Services,

"In September 1963, you appointed the Task Force on Health Manpower to assess current and projected personnel needs for the provision of community health services, to evaluate methods of recruitment, use, and education of health manpower, and to recommend ways of assuring optimal numbers, quality, and use of health personnel.

"We hope that our report and recommendations fulfill the important objectives you set for us and that this document will contribute to the larger undertaking of the National Commission on Community Health Services.

"The recommendations of the Task Force are designed to aid health institutions and agencies, educational institutions, professional and occupational groups, government at all levels, and workers in the health professions and occupations in their efforts to achieve effective mobilization of the key resource of health manpower. The provision of comprehensive community health services in the decade ahead cannot be accomplished without this mobilization. Indeed, implementation of many of the recommendations of the other Task Forces of the Commission requires proper development of this essential resource.

"While this report has been prepared at the request of the Commission, in a larger sense it is addressed to the American people. Both citizens and health workers in every professional and occupational group must take concerted action to assure an adequate supply of well-qualified health personnel working effectively towards the goal of better community health services. In the last analysis, our health services can be only as good as the health workers who provide them."

NATIONAL TASK FORCES PROJECT

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Preface

Community health services have been developed in the United States over the first half of the twentieth century to meet emerging needs. The adequacy of these services varies widely in different communities, depending upon economic and social conditions and resources.

During the two decades following World War II, a vast new array of knowledge in the health field has evolved from the scientific and technological revolution. At the same time, revolutionary changes have taken place in community health problems as a result largely of urbanization, and of growth, movement, and aging of the population. These changes have led to an urgently increased need for community health services both in the field of environmental health and in the provision of personal health services. The new knowledge and the changing problems have sharply spotlighted an obvious need for new and different approaches to the provision of community health services in the United States.

Two national organizations with a primary interest in health, The American Public Health Association and The National Health Council, jointly developed a plan for the study of community health services. It led to the creation of The National Commission on Community Health Services, an independent body charged with responsibility for reviewing health needs and resources and for evolving a far reaching proposal for the development of community health services for the next decades. This project was financed in part by the Kellogg Foundation, the United States Public Health Service, the McGregor Foundation, the Vocational Rehabilitation Administration, the Commonwealth Fund and the New York Foundation. The Commission was established in 1962 with the intent of completing its work and reporting to the nation in approximately a four-year period. The basic focus of the Commission has been the study of local communities and their health services as these relate to state and national agencies. The work of the Commission was carried forward by two project groups--the Community Action Studies Project and the National Task Forces Project.

The Community Action Studies Project sought to identify the dynamics of effective community action planning which led to improved health services in 21 selected communities of various sizes and descriptions.

The National Task Forces Project approached its responsibility for evaluating community health needs, issues, and resources somewhat differently. Six Task Forces were established, each focusing on a major area of study, but all employing the broadest possible concept of community health services. The Task Forces included: Environmental Health, Comprehensive Personal Health Services, Health Care Facilities, Health Manpower, Financing Community Health Services and Facilities, and Organization of Community Health Services. Each was composed of from 12 to 20 informed citizens and professional leaders reflecting the interest and concerns of different segments of society and the nation. The Task Forces were charged with the following responsibility:

1. To define local community health needs and issues.
2. To review and delineate voluntary and governmental programs on the national, state and local levels, as these affect the provision, availability, and acceptability of community health services.
3. To identify and evaluate resources, practices, and trends, as these affect the provision of community health services.
4. To assess the present status of community health services.
5. To consider social, economic, demographic, and other major trends which bear on community health services.
6. To estimate future conditions which will determine needs and affect the provision of community health services.

The Task Forces held a total of more than 80 two-to-three-day meetings in retreat settings, during which time health needs and issues were studied intensively. Individual task force members prepared position papers and reviewed available information concerning their particular charge. Technical staff and consultants working with the Task Forces incorporated comprehensive discussions and specially prepared documents, developed drafts of reports, and noted agreed upon recommendations.

Throughout this process the chairmen and other members of the individual Task Forces met intermittently with the Commission to share emerging recommendations and to report Commission reactions back to their individual groups. Intercommunications among the various

Task Forces was maintained by an Advisory Committee to the Project composed of the chairmen of all Task Forces. Individual Task Forces were coordinated and correlated through this Committee but were given a high degree of independence. In addition, the staff made tentative reports available to each Task Force in order to facilitate coordination of recommendations.

It should be emphasized that in creating the Task Forces, the Commission gave each the freedom to develop its own concepts of the needs for improved community health services and, as well, freedom to publish its own report without acceptance necessarily by the Commission of all recommendations. Thus the independence of each Task Force to determine methods, procedures and content for final reports was kept inviolable.

As noted earlier, sweeping policy changes--particularly federal--have occurred during the past three years which affected basic assumptions hardly less than tentative conclusions. Nevertheless, the essential emphasis throughout the reports has been on the decade ahead. In many ways the recommendations contained in individual Task Force reports supplement, and--we hope--give more specific direction to these policy changes which so vitally affect community health throughout the nation.

I wish to give special recognition to the devoted and loyal services of the chairmen of the individual Task Forces: Gaylord W. Anderson, Ray E. Brown, Richard W. Case, Lenor S. Goerke, Leonard W. Mayo, Isidor S. Ravdin. As these hard-working leaders in turn would be the first to admit, the reports of their Task Forces could not have been achieved without the selfless labors of the members of their individual Task Forces and the technical staff who have served them so well.

Much credit is also due to staff of the National Commission for the organization and support of the project, with special recognition to Walter M. Beattie, Jr., Staff Director of the Task Forces Project, without whose untiring and dedicated effort the Project could not have been completed.

This report represents the work of one of the six Task Forces. It is important to recognize the interrelationships of the several Task Forces in regard to overall community health needs, resources and services, while at the same time recognizing the unique independence of each one. It has been a privilege to contribute toward achieving the goals of the National Commission on Community Health Services, and to have been associated with each of these six Task Forces.

Ernest L. Stebbins, M.D., Chairman
Advisory Committee to the
National Task Forces Project

Introduction

"We must look to the future in planning to meet the health manpower requirements of the Nation.

"Unmet health needs are already large. American families are demanding and expecting more and better health services... If we are to meet our future needs and raise the health of the nation, we must--

- improve utilization of available professional health personnel;
- expand the use and training of technicians and ancillary health workers through special schools and under the Vocational Education Act and Manpower Development and Training programs;
- expand and improve training programs for professional and for supporting health personnel;
- plan ahead to meet requirements for which the lead-time is often ten years or more."--President Lyndon B. Johnson, "Advancing the Nation's Health," Health Message to the 89th Congress, January 7, 1965.

The American people are demanding more and better health services--better child care, improved treatment of the mentally ill, care for the chronically ill, a cure for cancer, expansion of dental facilities, control of environmental hazards, lower cost drugs, ample rehabilitation services, more public health nurses--in short, the benefits of modern science for the promotion of health and the care of the sick. No day passes without comment on health needs and health care in the press, on television, and in the day-to-day life of ordinary people. Popular recognition that life is important and that science has the knowledge to combat illness and assure health have produced a heightened sensitivity to health problems and a demand for high-quality patient care for all.

To meet such heightened public expectations of health service, adequate numbers, kinds, and quality of personnel are essential. Community requirements for health manpower are further affected by other social, economic and scientific forces: changes in the size, location, and composition of the population; scientific and technological advances; and new patterns in the organization of medical care.

Experts estimate that the population of the United States will exceed 225 million by 1975. Nearly half of these persons will be young or old--either under 18 or 65 years and older. About two-thirds of all males entering the labor force at age 18 will survive to retirement at age 65, and their remaining lifetime will average about 13 years. Today nearly three-quarters of the American people live in large urban centers, and mobility is continuing in the direction of the metropolis. At the same time, there has been a mushrooming of suburbs around our cities. This migration accentuates the vast stretches of sparse settlement in rural areas. Regional shifts in population to the West and the Southwest are also changing the distribution of the population.

These trends have profound implications for health services and health manpower. Population increases of the magnitude anticipated require vastly expanded health services and more personnel with new skills. Fortunately, more health workers can be drawn from the enlarged manpower pool. So serious is the problem of degenerative disease, largely associated with the aging of the population, that the problem of the three great killers--heart disease, cancer, and stroke--has become a matter of national policy. Personnel must be available to implement the legislative decision to establish regional complexes for research, training, and service to attack these diseases.

The concentration of population in urban centers makes imperative the development of scientific and social measures to control hazards in the physical environment and skilled personnel to implement these measures. Improved transportation has made health services generally accessible to people in and near the cities, but health personnel and facilities are limited in rural areas. Depopulation of rural areas challenges the ingenuity of health service personnel in planning, organizing, staffing, and financing modern health services for people remote from modern medical centers.

The American people expect to reap the benefits of modern science. New knowledge about health and disease and technological innovations are revolutionizing the provision of medical care and the use of health personnel. New drugs and new preventive, therapeutic, and rehabilitative measures, developed from extensive research in the medical, biomedical, physical, engineering, and social sciences, are increasing the productivity and effectiveness of health workers. New methods of providing care and new kinds of services call for new skills and new kinds of health workers. Interdisciplinary cooperation has become essential. Improved standards of education and effective use of health manpower can, to a large extent, close the gap between new knowledge and its application to human needs. Health professionals in the future must find ways to bring the benefits of scientific advances to the people without delay. At the same time, the public must become aware of its responsibility in taking preventive health measures, in recognizing symptoms, and in using health services economically.

Changing methods of organizing health services and of paying for them affect the numbers of health personnel needed and the ways in which they work. Many kinds of specialists are needed for modern medical care, and yet comprehensive care must be provided for the patient as a whole and for his family. The solution to this problem is being sought increasingly in the team approach to the delivery of health services.

A variety of settings for the provision of health care is emerging. Reflecting this broadened framework are: the location of physicians' offices in relation to one another and to the community hospital; the reaching-out of the hospital into the patient's home; the increasing use of extended care facilities as satellites to general hospitals; the development of new kinds of community facilities for outpatient care; and the use of health personnel in many educational and welfare settings. These changes have profound implications for provision of services, relationships of health workers, and approaches to training and job performance.

Methods of payment for health services are also changing. The expansion of organized programs of medical care through prepayment and through the increasing participation of government is creating new relationships among health personnel, health agencies, the individual and his family, educational institutions, and government. These developments are enabling health service personnel to meet the demand for more and better health services.

BACKGROUND OF THIS REPORT

This report was conceived and produced at a time when planning for health services in America was in active ferment. During the deliberations of the Task Force, the nation was engaged in a great debate on vastly expanded health care for the aged, with tremendous implications for manpower; shortly before the completion of our report, far-reaching national legislation was enacted. During this period also, two epoch-making reports appeared. The medical schools of the nation through the Association of American Medical Colleges were reexamining their purposes and methods, culminating in the Coggeshall Report, "Planning for Medical Progress through Education." New national attention was given to improved methods of attack on the great killers: heart disease, cancer, and stroke. The DeBakey Report was issued, and legislation embodying its main proposals was enacted--with important implications for expanded federal aid for the education of physicians, dentists, and other health personnel.

In September 1963 the National Commission on Community Health Services appointed a Task Force on Health Manpower to determine the most effective and efficient methods of providing the manpower required for the provision of community health services through:

(a) assessment of the current and projected personnel needs required for the provision of community health services;

(b) evaluation of current methods of recruiting, education, training, and developing, motivating, and utilizing manpower--both professional and volunteer;

(c) recommendation of ways to assure availability and optimal utilization of manpower, based upon present and projected community health needs.

A number of previous and valuable investigations of the supply and need for health manpower have been specifically concerned with physicians, dentists, nurses, and environmental health personnel, to mention but a few. This Task Force, therefore, chose to take an overview of health manpower involving all the health professions and occupations of all levels of skill. The concern is total health manpower for both the public and private sectors of health service. Included are not only traditional jobs that have been defined by long experience but emerging new roles and positions in developing programs of health service.

The central assumption of the Task Force has been that manpower requirements are determined by the content and character of health services. This functional approach led us to consider health manpower in its relationship to population changes, increased urbanization, complex modern community organization, higher levels of education, and new programs of health service. The problem of manpower was viewed in the setting of a generally affluent society addressing itself to an attack on depressed and poverty-stricken groups through the Economic Opportunity Act.

At the outset, our Task Force recognized that its main task was not, as one study has said, "to undertake a fine adjustment of supply and demand" but rather to suggest ways of expanding the total pool of health manpower to meet needs, of raising each health worker to his maximum productivity, and of promoting the highest quality in personnel. For this reason, we addressed ourselves to resources for health manpower; to effective use of health manpower; to recruitment; and to education and training for the wide range of health personnel needed for modern services.

The Task Force reviewed the many reports and studies on health manpower produced by government agencies, professional groups, voluntary organizations, and eminent individuals. Members of the Task Force prepared working papers on special aspects of the problem. Experts from government, voluntary organizations, professional and occupational groups, and universities provided thoughtful consultation. The limitations of time and staff unfortunately prevented the collection of original data; further work is necessary to pinpoint the detailed needs in various fields of health service under different patterns of care.

The Task Force is indebted to many individuals and organizations for their help, both on the overall problem and in response to requests for specific information. We are especially indebted to the other Task Forces of the National Commission and their individual members, who recognized with us the inseparability of health manpower from all features of health service.

The Chairman and members of the Task Force wish to express their appreciation to Dr. Leo G. Reeder and Mrs. Ruth Roemer, who served as Technical Staff to the Task Force, for their patient and able work in carrying out the research and in welding the deliberations of the Task Force into a unified report. Deep appreciation also goes to Dr. William L. Kissick and Dr. Maryland Y. Pennell, consultants from the federal government, for their important contributions. Mr. Thomas E. Hanrahan and Dr. Darrel Mase provided the Task Force with valuable information. We are indebted also to many other persons--to several faculty members of the UCLA School of Public Health for helpful insights into the problems of health manpower and to Dr. Esther Lucile Brown, formerly member of the executive staff of the Russell Sage Foundation and now consultant in psychosocial aspects of patient care, for her critical review of the entire manuscript. We feel a particular sense of gratitude to Mr. Walter M.

Beattie, Jr. He not only gave every assistance at numerous meetings, but he reinforced the Task Force with his enthusiasm, energy, and broad understanding of health services in the modern social environment.

As Chairman, I should like to express my personal thanks to the members of the Task Force on Health Manpower, each of whom brought to the protracted deliberations of the group a wealth of knowledge and judgment not only in the field of his special competence but on the total problem. No better testimonial can be made to the devotion of these individuals than the quality and unanimity of their recommendations, achieved in spite of significant differences in point of view and emphasis.

If any single feature of the health manpower landscape can be said to have claimed priority in the deliberations of the Task Force, it is the need to assure adequate numbers of competent allied and auxiliary health personnel. While each member of the Task Force understandably emphasizes the field of his expertise, all were agreed on the urgency of developing and using effectively allied and auxiliary health personnel of many kinds. If this report has any long-term contribution to make, it is hoped that it will lie in its emphasis on this approach.

Now it is up to each of the health professions and occupations, to governmental and voluntary health agencies, to educational institutions, and to citizens and their representatives to translate the recommendations of this report into the achievement of more and better health manpower. A prescription of what is required is easy to state. To take the steps necessary to assure an adequate supply of well-qualified health personnel, working effectively, will require immense energy, ingenuity, and dedication to the goal of better community health services. Difficult and continuing as that task may be, there can be no turning away from it.

L. S. Goerke, M. D., Chairman
Task Force on Health Manpower

Los Angeles, California

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CHAPTER I

Summary and Recommendations

Public demand for a healthful environment and for medical care commensurate with the progress of science requires qualified health manpower in vastly increased numbers. New legislation providing expanded health care for the aged and regional centers for attack on the great killers--heart disease, cancer, and stroke--symbolizes the national commitment to health services of great scope and high quality. Many kinds and adequate numbers of well-prepared, dedicated, and responsible health workers, whose efforts are efficiently organized and coordinated, are required to meet this unprecedented challenge.

The issues involved in the achievement of health manpower goals will be resolved in part by action at the local community level, in part by action at the state and regional levels, and in large part by action at the national level. The recommendations of this Task Force concern those measures which must be taken at each of these levels to assure an optimal supply of well-qualified health manpower for the total spectrum of governmental and voluntary health services for the next ten years. Many of these measures require considerable lead time. Planning and action must begin now to assure sufficient qualified health personnel by 1975.

PLANNING FOR BETTER USE OF HEALTH MANPOWER

Effective planning at the federal, state, and local levels for the recruitment, education, and use of personnel is basic to assure an adequate supply of qualified health manpower. Governmental and voluntary health agencies, professional and occupational groups, educational institutions, and employers of health personnel must work

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cooperatively to improve planning related to health manpower.

Fundamental to effective manpower planning is rational integration of health facilities--physicians' offices, public ambulatory care facilities, hospitals and nursing homes, and other facilities. Appropriate organization of these facilities determines, in large measure, equitable geographic distribution of personnel, economy in the use of personnel, and extension of as many services as possible to people where they live and work.

Fragmentation of health services among numerous agencies and jurisdictions results in misuse of manpower. Coordination contributes to effective use of scarce and skilled personnel by eliminating gaps and duplications in service. Therefore, state and local agencies must give priority to coordination of programs of preventive, curative, and rehabilitative services in planning for health manpower.

- Planning for health manpower resources should be undertaken jointly by those governmental and voluntary agencies responsible for planning health services and facilities. Government should take the initiative. (Recommendation 1)

At the federal level, planning for health manpower is an integral part of all programs of health service. At the state level, the agencies responsible for planning health services and facilities should likewise exercise leadership in planning related to health manpower. State departments of public health and other appropriate state agencies should work with voluntary planning agencies, associations of health workers, educational institutions, state commissions of higher education, state licensure authorities, and other agencies to study requirements for health personnel, to assess resources available for training, and to stimulate educational programs that are responsive to health manpower needs. State agencies should make available to local communities consultants skilled in planning and administration of health services. Effective use of health manpower in regions, states, and local communities depends on adequate, efficient, well-equipped, and properly located hospitals and other facilities. Planning for health manpower must go hand in hand with planning of services and facilities.

- Governmental, private, and voluntary agencies, together with professional associations, should encourage and give financial support to innovations in ways of providing health services that will increase the productivity of highly skilled personnel and improve the range and quality of services. (Recommendation 2)

Tests and demonstrations of new approaches to the provision of health services should include, but not be limited to, experiments with various ways of organizing ambulatory health facilities of all kinds--physicians' offices, outpatient departments of hospitals, home care programs, community mental health centers, and dental clinics. Efficient use of personnel depends on rational organization of health services and facilities.

- Government at all levels should, by example and financial support, encourage coordinated programs of health service as a means towards effective use of personnel. (Recommendation 3)

Coordination of health services should be stimulated to use scarce personnel economically and to provide a continuum of comprehensive health services. Official and voluntary health agencies, working with professional groups, should review all programs of preventive, curative, and rehabilitative service for gaps and duplications that are at odds with effective use of manpower. In seeking ways to combat fragmentation of services and extravagant use of manpower in numerous overlapping agencies and jurisdictions, communities should explore the possibility of developing community health centers, group medical and dental practices, combined public health nursing services including those in schools, combined public health-industrial health programs, and centralized laboratories.

HEALTH MANPOWER STATISTICS AND INFORMATION

More than three million persons in some 40 health occupations participate in the provision of health services. Nevertheless, comprehensive information for the nation as a whole pertaining to the supply, distribution, and use of this substantial manpower force is not available. Basic to sound planning for effective recruitment, education, and use of health manpower is comprehensive, comparable, and detailed information on all professional, technical, and auxiliary health workers.

- The United States Public Health Service should assume responsibility for collecting and reporting health manpower data on a nationwide basis, using standardized classifications, in cooperation with associations representing health occupations, educational institutions, and voluntary agencies. (Recommendation 4)

Information needed includes descriptions of individuals who supply health services (e.g., age, education, certification, location) and characterization of the activities in which these persons engage (e.g., employer or organizational sponsorship, mode of practice, specialization, remuneration, and nature, location, and volume of patient services). Federal funds should be made available to permit the development of methods of collecting, interpreting, and using such information. Associations representing the health professions and occupations should cooperate in this effort by maintaining lists of members and nonmembers, active and inactive, who are qualified for their respective specialties through education and experience. To augment information on health manpower resources and trends, educational institutions should maintain uniform statistics on all students.

ALLIED AND AUXILIARY HEALTH WORKERS

The most promising single measure for assuring an adequate supply of health manpower is optimal use of large numbers of allied and auxiliary personnel. Adequate numbers of such workers can permit the efficient use of highly educated and specialized personnel. Many allied health workers have a unique competence in specific segments of health service. With adequate supervision and effective liaison among related professional and occupational groups, allied health workers in different specialties and with varying levels of edcation and training can make an enormous contribution to enlarging the provision of community health services. Their participation in the health team can enhance the quality of services and implement the principle that health personnel should not normally be used for tasks below the level for which they are prepared.

- Educational institutions, health agencies, and health workers--individually and through their associations--should give high priority to increasing the numbers of both existing and new kinds of allied and auxiliary personnel. (Recommendation 5)
- The health team should function with each member contributing his most highly developed skills. Innovation and experimentation should be undertaken to expand and develop the roles of allied and auxiliary personnel. (Recommendation 6)

In order to develop fully the roles of allied and auxiliary workers, health agencies and professional and occupational associations should undertake continuing assessment and evaluation of the character of health services and the personnel required to provide them. All allied and auxiliary personnel should work under professional supervision, and harmonious interdisciplinary relationships should be encouraged to assure an effective team work of skills. Examples of expanded roles for allied and auxiliary personnel include the following:

--use of dental hygienists and other assistants with broadened functions as a regular part of all dental practices;

--use of health personnel with vocational training for programs of personal health service and environmental health;

--use of hospital and home nursing aides, physical and occupational therapy aides, x-ray and laboratory aides, clerical workers, and others to free highly educated personnel of certain tasks;

--use of homemakers and home-health aides to enlarge the effectiveness of visiting nurse services and home care programs;

--use of mental health counsellors to extend mental health services;

--use of volunteers, appropriately prepared and supervised, to augment manpower resources.

HEALTH SERVICE ADMINISTRATORS

Traditionally, top-level administration of health services has been under the almost exclusive direction of physicians. As programs of organized health services have increased in scope and complexity, it has become increasingly clear that the years of clinical training for physicians do not necessarily equip them for administration and social organization. Administration of modern programs of organized health care requires a different kind of specialized talent and organization. Health care administrators, educated in the social and administrative sciences, as well as in the health sciences, are appropriately prepared for administration and planning and can free physicians for clinical tasks which only physicians can perform.

Hospitals have pioneered in the use of non-medical administrators. Through careful definition of administrative and clinical responsibilities, the administrator in many hospitals has been able to work in partnership with highly skilled physicians to provide progressive administration of health services. In programs of community health service as well, informed, imaginative, and influential leadership by qualified administrators can achieve efficiency and fulfill the potential of these programs.

- Governmental and voluntary community health agencies and institutions should recruit qualified administrators, not necessarily physicians, for planning and administering programs of health service. (Recommendation 7)

Well-prepared administrators will be available in sufficient numbers for planning and administering health services only if schools of public health and university programs of hospital and health administration give priority to preparing them.

QUALITY OF PERSONNEL

The achievement of adequate numbers of personnel of various kinds is not enough to assure satisfactory health services. Maintenance of quality of personnel is also essential. Health care of high quality requires personnel of high quality.

- Educational institutions, voluntary and governmental agencies, and professional and occupational groups should make every effort to improve education and performance for each class of health personnel in order to increase productivity and to raise the quality of health services. (Recommendation 8)
- National minimum requirements for licensure of personnel in all the health professions and occupations should be established, with freedom for the states to set higher standards to meet their individual needs. (Recommendation 9)

Wide variations in licensure requirements among the states and lack of reciprocity affect adversely the quality, quantity, and distribution of health personnel. A systematic and objective study of state licensure requirements for all the health professions and occupations is urgently needed.

- Health agencies and professional organizations, in cooperation with educational institutions at all levels, should develop programs of public education to help potential consumers of health services participate intelligently in their health care. (Recommendation 10)

Health agencies and professional organizations should intensify their efforts to increase public understanding of the danger from cultists and others whose practice does not follow scientific principles. The total community, both young and old, must be made aware of available health services. Only an educated public can make intelligent choices for health protection and take advantage of the appropriate kinds of specialized health personnel and resources.

RECRUITMENT OF HEALTH MANPOWER

Rising levels of education for men and women at all ages signal a favorable outlook for the supply of potential health manpower. The field of health services, however, is in competition for personnel with many other fields of work. Accurate and current information about opportunities for work in the health services must be brought to students and faculty. New and imaginative ways must be found to present to students at all stages of their education the wide variety of possible health careers.

Certain groups within the population constitute a reservoir of potential health manpower that has not been fully tapped. Removal of discriminatory barriers against these groups is, of course, a matter of justice. Affirmative steps to recruit personnel from these groups would reach neglected sources of talent and would add significantly to the total pool of health manpower.

Techniques of recruitment to attract personnel from various sources to the field of health service generally and to specific health professions and occupations must be strengthened and improved. In large measure, the recruitment and retention of health manpower depend on favorable conditions of work in each specialty and, above all, on the opportunity for rewarding, creative work.

- Concerted efforts should be made to interest students in health careers through improved counselling, work experience in health facilities, and expanded work-study programs. (Recommendation 11)

Universities and health agencies should conduct regular programs on health services and health careers for guidance counsellors from high schools and colleges. High schools should assign to a member of the faculty or staff responsibility for coordinating activities designed to present accurate and current information to students about health careers. Professional schools, professional organizations, and health agencies should take the initiative in publicizing opportunities for creative and rewarding work in the health services among college students and faculty. The best recruiters are health career workers with high morale, enthusiasm, and job satisfaction. Work-study programs in state and local health agencies should be buttressed with federal and private financial aid to provide grants to students and to subsidize supervision and evaluation for these programs.

- Government at all levels, educational institutions, health agencies, and professional and occupational groups should undertake positive measures to recruit health personnel from special groups that have not been fully tapped. (Recommendation 12)

Arbitrary barriers, prejudice, and inadequate opportunities for education and employment have in the past blocked full use of the manpower resources of numerous groups. These groups include, among others, students of limited means; students from minority groups; women; military health personnel returning to civilian life; inactive health personnel; volunteers; technologically displaced workers; physically handicapped workers; retired and older workers; and health personnel working below their potential. The nation can ill afford to continue to neglect these valuable reservoirs of potential health manpower.

- State health departments and other agencies responsible for manpower planning should assign top priority to stimulating individuals, agencies, and occupational groups to examine and improve working conditions and opportunities for career satisfaction in all fields of health service. (Recommendation 13)

In a highly competitive environment, the opportunity for career satisfaction is often critical in recruitment of personnel. While competitive salaries and wages are important, opportunities for individual growth may be more significant, especially at the higher professional and technical levels. Civil service regulations and retirement policies should be examined and revised to allow more flexibility in recruitment and more mobility of personnel than at present. Governmental and voluntary agencies should review, develop, and improve techniques of recruitment to health careers. The pioneering work of the National Health Council and state health careers councils should be strengthened by federal and private financial support for continuing review of the national manpower problem and development of techniques of recruitment.

EDUCATION AND TRAINING OF HEALTH MANPOWER

The goal of increasing the numbers of persons educated and trained for the health professions and allied occupations is fundamental. At the same time, educational efforts must seek to expand the range of skills and to raise the quality of skills as required for the provision of modern, comprehensive community health services. To achieve these goals, existing educational facilities must be expanded, new ones established, and the content and quality of the many health curricula improved.

Scientific, professional, and selected technical personnel should be educated in institutions of higher education, with opportunities for intimate contact with community health programs and personnel. The training of other health personnel should be related to educational institutions but with intimate involvement in ongoing programs of community services. Only if health service personnel are educated with appreciation of the problems of providing preventive, curative, and rehabilitative services in a community setting can they be equipped to provide comprehensive health care in its full scope.

- Educational programs for the health occupations in two-year colleges should be expanded and developed as rapidly as is consistent with quality. (Recommendation 14)

The two-year college provides a great potential source of personnel for the health occupations. The challenge to health agencies and educators is to realize this potential. New and better curricula need to be developed and students found to take advantage of them. Part of the training should be provided in clinical settings where students can learn to work with allied health personnel under proper supervision.

- Current efforts to expand and utilize existing medical and dental schools and to establish new ones should be continued and intensified. (Recommendation 15)

In order to utilize existing medical and dental school facilities fully, consideration should be given to encouraging a variety of special programs that permit students to complete their formal education in a shorter period of time than at present.

- Dental schools should assume increased responsibility in the training of auxiliary personnel with broadened functions and should promote their use by example. (Recommendation 16)

Medical and nursing schools should, similarly, assume responsibility in the preparation of allied and auxiliary personnel.

- Current efforts should be intensified to develop nursing education programs that meet the standards required for national accreditation for professional nurses prepared in baccalaureate programs and for technical nurses prepared in two-year colleges or, during an interim period, in hospital diploma programs as well. Other nursing personnel should be prepared in vocational programs. (Recommendation 17)

Four-year colleges and universities should provide a broad liberal arts foundation with thorough education in nursing at the professional level. These nurses should be qualified to demonstrate a high level of nursing care; to assume team leadership; and, with further education, to assume other responsible positions in nursing service. Continuing emphasis should be placed on increasing the number of professional nurses with preparation beyond the baccalaureate degree who are qualified for faculty positions in schools of nursing and for administrative positions in nursing service.

Two-year colleges, providing appropriate clinical experience in affiliated hospitals, should prepare large numbers of nurses who qualify for licensure as technical nurses. During an interim period, high-quality hospital schools of nursing should continue their preparation of nurses who are eligible for state licensure.

Vocational education programs in public schools should train assistant nursing personnel. Programs maintained by public schools must be closely affiliated with hospitals and other health agencies. All training programs for nursing assistants should meet accepted standards for vocational education.

- Schools of public health should revise their programs to meet the emerging needs for health service personnel, with special emphasis on the preparation of personnel qualified in administration. (Recommendation 18)

Schools of public health should abolish the prerequisite of experience in public health for admission and should seek to recruit students, qualified directly upon completion of their undergraduate studies.

Preparation for hospital administration should be encouraged in schools of public health, where education can be offered in the broad community aspects of health services as well as in business administration.

- Educational institutions should provide several programs of education for environmental health personnel--for engineers and scientists; for sanitarians; and for environmental technicians. (Recommendation 19)

Engineers and scientists, equipped to design programs, carry out research, interpret scientific findings, and supervise the monitoring of programs of environmental control, should be educated in baccalaureate and higher degree programs. Sanitarians should have a baccalaureate degree with a major in the physical or biological sciences. Environmental technicians should be prepared in two-year programs.

- Preparation of specialized personnel in the allied health professions (social workers, clinical psychologists, speech pathologists, audiologists, rehabilitation counsellors, and others) should incorporate instruction and experience in the broad range of health services and participation in the functioning of the health team in the community. (Recommendation 20)

Every effort should be made to develop qualified and properly oriented faculty for academic and field instruction for the allied health professions.

- Innovations and demonstrations should be undertaken to develop new methods of preparing personnel of various kinds to staff expanding community programs in mental health and mental retardation. (Recommendation 21)

- Every effort should be made by educational institutions, operating agencies, and professional and occupational groups to identify and carry out their individual and mutual responsibilities for in-service training and continuing education. (Recommendation 22)

Universities should provide leadership in developing new and useful programs of continuing education. Professional and occupational groups and their individual members should take initiative in the development and sponsorship of such programs. Official and voluntary agencies, including hospitals, should identify needs for continuing education and provide funds and time for staff to participate in educational opportunities. Cooperative efforts in continuing education between universities and professional organizations are essential.

Each individual health worker must assume responsibility for continuing his education throughout his working life.

RESPONSIBILITY FOR FINANCING EDUCATION

Financing education for the health professions and occupations is the responsibility of students, colleges, government, industry, private foundations, and individual benefactors. The wide support of education in the United States is a tribute to the wisdom of all these groups.

Since the development of specialized manpower to meet the health needs of the people is a national concern, it is appropriate for the federal government to provide financial support to ensure the preparation of sufficient health personnel at all levels. Continued and increased financial support of education for the health services from all levels of government is a *sine qua non* for achieving adequate numbers of high-quality health personnel; but the most important source of funds is the federal government with its broad tax base.

- *Federal support for capital and operating expenses of educational institutions, for research and demonstrations, and for scholarships and fellowships should be continued and augmented in such ways as to give maximum stimulation to funding from other sources, including the private sector.* (Recommendation 23)

CHAPTER II

Manpower Resources and Trends[1/]

Upwards of 3,000,000 persons, comprising between 4 and 5 percent of the total civilian labor force, are engaged in the provision of health services in this country. Such manpower may be viewed as part of a health services industry or along occupational lines. Some overlap exists between these two approaches.

HEALTH SERVICES INDUSTRY

Information on the health services industry is available from the 1960 Census of Population. In 1960, as seen in Table 1, about 2.6 million persons were employed in hospitals, clinics, health organizations, private offices, laboratories, and diverse places where medical and other health services are provided. This count does not include military personnel in hospitals and elsewhere who also contribute to the health of the nation.

Another half million or more persons are in industries directly or indirectly related to health services. For example, large numbers of workers are engaged in the manufacture of drugs and medicines and related wholesale and retail trade.

An additional half million persons in occupations usually considered in the health field are employed in other than the health services industry. For example, only 3 percent of the veterinarians and 7 percent of the pharmacists are classified by census data in health services; these persons are usually classified in agriculture or retail trade.

Detailed occupations reported in the 1960 Census for persons employed in hospitals and in other health settings give some indication of the wide range of skills, aptitudes, and interests required to

TABLE 1. OCCUPATION OF PERSONS EMPLOYED IN THE CIVILIAN LABOR FORCE: 1960

Detailed occupation a/	All industries	Health services	Percent health
All occupations	64,646,563	2,589,253	4.0
Professional, technical, and kindred	7,223,241	1,167,218	16.2
Accountants and auditors	469,702	4,077	.9
Chiropractors	13,853	13,630	98.4
Clergymen	199,701	2,275	1.1
Dentists	86,887	85,263	98.1
Dietitians and nutritionists	26,470	18,190	68.7
Engineers, technical	859,547	2,775	.3
Lawyers and judges	208,696	1,696	.8
Librarians	84,332	6,918	8.2
Natural scientists:			
Biological scientists	13,415	4,036	30.1
Chemists	81,120	3,133	3.9
Physicists and other natural scientists	53,650	585	1.1
Nurses, professional	581,289	528,771	91.0
Nurses, student professional	57,746	57,746	100.0
Optometrists	16,205	13,073	80.7
Osteopaths	4,081	3,861	94.6
Personnel and labor relations workers	98,257	4,379	4.5
Pharmacists	92,233	6,504	7.1
Photographers	50,735	1,529	3.0
Physicians and surgeons	229,671	218,301	95.0
Public relations men and publicity writers	30,593	722	2.4
Recreation and group workers	37,487	1,507	4.0
Religious workers	57,069	1,386	2.4
Social and welfare workers, except group	95,103	9,795	10.3
Social scientists:			
Psychologists	11,694	3,522	30.1
Statisticians and actuaries	20,711	743	3.6
Teachers (elementary, secondary, n.e.c.)	1,670,810	3,666	.2
Technicians, medical and dental	138,813	127,947	92.2
Technicians, electrical engineering and other	277,905	1,589	.6
Therapists and healers (n.e.c.)	36,568	25,272	69.1
Veterinarians	15,205	382	2.5
All other	1,603,693	13,945	.9

TABLE 1. OCCUPATION OF PERSONS EMPLOYED IN THE CIVILIAN LABOR FORCE: 1960
(continued)

Detailed occupation a/	All industries	Health services	Percent health
Operatives and kindred workers ----	11,920,442	62,441	.5
Deliverymen and routemen --------	422,622	826	.2
Dressmakers and seamstresses, except factory ----------------	119,965	5,574	4.6
Laundry and drycleaning operatives	385,065	32,315	8.4
Meatcutters, except slaughter and packing ----------------------	180,302	1,479	.8
Photographic process workers ----	40,747	509	1.2
Stationary firemen -------------	88,314	5,726	6.5
Taxicab drivers and chauffeurs --	162,881	2,331	1.4
Truck and tractor drivers -------	1,555,793	2,658	.2
All other ----------------------	8,964,754	11,023	.1
Service workers, including household ----------------------	7,171,837	799,887	11.2
Attendants, hospital and other institution ------------------	391,136	365,690	93.5
Attendants, professional and personal service -------------	70,520	2,156	3.1
Barbers ------------------------	179,670	1,190	.7
Chambermaids and maids ----------	167,913	34,557	20.6
Charwomen and cleaners ----------	182,279	21,846	12.0
Cooks, except private household -	563,932	47,234	8.4
Counter and fountain workers ----	157,415	10,828	6.9
Elevator operators -------------	73,500	5,388	7.3
Hairdressers and cosmetologists -	305,858	1,366	.4
Housekeepers and stewards -------	146,644	29,845	20.4
Janitors and sextons ------------	596,052	26,156	4.4
Kitchen workers (n.e.c.) --------	300,977	66,655	22.1
Midwives -----------------------	896	896	100.0
Porters ------------------------	142,718	12,219	8.6
Practical nurses ----------------	207,966	144,045	69.3
Protective service workers ------	688,256	6,604	1.0
Waiters and waitresses ----------	823,864	11,549	1.4
All other ----------------------	2,172,241	11,663	.5
Laborers -----------------------	4,532,950	12,172	.3
Gardeners, except farm and groundskeepers ----------------	195,092	3,109	1.6
All other ----------------------	4,337,858	9,063	.2
Occupations not reported ---------	3,181,548	28,160	.9
Managers, officials and proprietors --------------------	7,916,062	50,092	.6
Credit men ---------------------	46,592	962	2.1
Purchasing agents and buyers (n.e.c.) ---------------------	103,191	2,262	2.2
All other ----------------------	7,766,279	46,868	.6

TABLE 1. OCCUPATION OF PERSONS EMPLOYED IN THE CIVILIAN LABOR FORCE: 1960 (continued)

Detailed occupation a/	All industries	Health services	Percent health
Craftsmen, foremen, and kindred workers	8,753,468	67,742	.8
Bakers	106,535	2,028	1.9
Carpenters	822,803	4,416	.5
Electricians	339,053	3,280	1.0
Foremen (n.e.c.)	1,174,314	3,709	.3
Inspectors (n.e.c.)	100,574	5,340	5.3
Mechanics and repairmen	2,221,844	25,810	1.2
Opticians and lens grinders and polishers	20,406	1,772	8.7
Painters, construction and maintenance	376,022	5,796	1.5
Plumbers and pipe fitters	306,567	2,885	.9
Stationary engineers	267,415	9,650	3.6
All other	3,017,935	3,056	.1
Clerical and kindred workers	9,303,231	399,703	4.3
Agents (n.e.c.)	158,610	1,511	1.0
Attendants, physician's and dentist's office	72,171	70,607	97.8
Bookkeepers	916,453	21,622	2.4
Cashiers	471,878	5,420	1.1
Fileclerks	132,925	4,265	3.2
Messengers and office boys	59,752	2,311	3.9
Office machine operators	304,952	3,119	1.0
Payroll and timekeeping clerks	105,917	1,768	1.7
Receptionists	134,866	55,286	41.0
Secretaries	1,463,731	101,339	6.9
Shipping and receiving clerks	278,210	645	.2
Stenographers	269,759	9,289	3.4
Stockclerks and storekeepers	329,661	6,899	2.1
Telephone operators	354,200	14,706	4.2
Typists	521,240	19,337	3.7
All other	3,728,906	81,579	2.2
Salesworkers	4,643,784	1,838	b/

a/ Selection among the 297 specific occupation categories of those in which at least 500 persons were employed in the health-service industry. Some health occupations are not treated as specific categories. Based on 5 percent sample.

b/ Less than 0.05 percent.

Source: "Manpower in the 1960's." Health Manpower Source Book, Section 18, Public Health Service Publication Number 263, U.S. Department of Health, Education, and Welfare. Washington, D.C.: U.S. Government Printing Office, 1964.

provide health services. Nearly half of the 2.6 million members of the health services industry have college degrees or are highly trained. Among these professional and technical workers the most numerous are physicians, dentists, nurses, and medical and dental technicians. Among the clerical, service and other workers the most numerous are attendants in physicians' and dentists' offices, attendants in hospitals, and other institutions, and practical nurses as well as receptionists, secretaries, mechanics and repairmen, laundry operatives, maids, cooks, housekeepers, janitors, and kitchen workers.

HEALTH OCCUPATIONS[2]

Manpower in the selected health occupations shown in Table 2 totaled nearly 2.2 million persons in 1960. Classified by major interest, workers in the medical field numbered 817,200--including physicians, pharmacists, medical secretaries and office assistants, x-ray technicians and medical laboratory technicians, and some less numerous occupations such as statisticians and analysts, health educators, and rehabilitation counsellors. Workers in the dental field totaled 221,900, including dentists, office assistants, hygienists, and laboratory technicians. The 1,087,300 persons in nursing comprised registered nurses, practical nurses, aides, orderlies, attendants, and homemakers. Environmental health is represented by engineers, sanitarians, health physicists, industrial hygienists, and other specialists, for a total of 22,300 workers. Health research is also a small field with 28,000 workers after the exclusion of physicians, veterinarians, and dentists engaged in research. These research workers are in the biological sciences, mathematics, physical sciences, and engineering.

Estimates are not available for personnel in food and drug protective services, health information and communications, medical engineering and electronics, and orthopedic and prosthetic appliance work--all of whom contribute to the provision of health services in the broadest sense. Further, data beyond 1960 are not available for personnel in administrative and clerical services, accounting and budget, legal assistance, public information, contract and procurement, construction and maintenance, supply, transportation, and many other skills.

Between 1950 and 1960 the number of workers in some 40 health occupations for which estimates are available increased from 1,531,000 to 2,176,700. Largest numerical gains were in medical and nursing fields, but relative growth was greatest in environmental

TABLE 2. ESTIMATED MANPOWER IN SELECTED HEALTH OCCUPATIONS: 1950, 1960, 1962-64

Health occupation[a]	1950	1960	1962-64
All occupations	1,531,000	2,176,700	---
Medical occupations	608,500	817,200	---
Physicians (M.D.)[b]	220,000	260,500	284,300[e]
Physicians (D.O.)[b]	12,700	14,300	12,900[e]
Administrators, hospital and other	8,600	12,000	12,500
Chiropractors	20,000	25,000	25,000
Dietitians and nutritionists	22,000	26,000	28,000
Educators, health	600	1,000	1,200
Medical secretaries and office assistants	70,000	80,000	---
Medical laboratory technologists-technicians	30,000	68,000	---
Medical record librarians	4,000	8,000	9,000
Medical record technicians	8,000	20,000	23,000
Medical x-ray technologists-technicians	30,800	70,000	---
Opticians and optical laboratory mechanics	19,200	20,300	21,000
Optometrists	17,800	17,300	17,000
Pharmacists	101,100	117,000	117,400
Podiatrists[b]	7,100	7,600	8,000
Psychologists, clinical and other health	3,000	8,000	8,500
Rehabilitation counselors	1,500	3,000	5,000
Social workers, medical and psychiatric	6,200	11,700	15,000
Social scientists, health (anthropologists, economists, sociologists, etc.)	[c]	[c]	500
Statisticians and analysts, health	2,000	5,000	---
Therapists, occupational	2,000	8,000	8,000
Therapists, physical	4,600	9,000	12,000
Therapists, speech and hearing	1,500	5,400	10,200
Veterinarians[b]	15,800	20,100	21,600
Dental occupations	170,400	221,900	---
Dentists[b]	87,200	101,900	107,800[e]
Dental hygienists	7,000	12,500	14,000
Dental assistants, dentist's office	55,200	82,500	84,000
Dental laboratory technicians	21,000	25,000	25,000

TABLE 2. ESTIMATED MANPOWER IN SELECTED HEALTH OCCUPATIONS: 1950, 1960, 1962-64 (continued)

Health occupation[a]	1950	1960	1962-64
Nursing occupations	733,500	1,087,300	---
Professional nurses	375,000	504,000	582,000[e]
Practical nurses	137,000	206,000	250,000[e]
Aides, orderlies, and attendants	221,000	375,000	410,000
Homemakers, home health aides	500	2,300	3,900
Environmental health occupations	11,600	22,300	28,000
Sanitary and health related engineers	6,000	8,000	9,000
Sanitarians	5,000	11,000	14,000
Radiological health specialists, including health physicists	[c]	2,000	3,000
Industrial hygienists	600	1,300	2,000
Health research occupations in the biological sciences, mathematics, physical sciences, and engineering	7,000	28,000[d]	---

[a] Estimates not available for personnel in food and drug protective services, health information and communications, medical engineering and electronics, and orthopedic and prosthetic appliance work.

[b] Total personnel, active and inactive. Other estimates are for active personnel only.

[c] Fewer than 500.

[d] Excludes about 11,000 physicians, veterinarians, and dentists engaged in research, who are included in the totals for these professions.

[e] Data as of 1964; other data as of 1962 or 1963.

Source: "Manpower in the 1960's." Health Manpower Source Book, Section 18, Public Health Service Publication Number 263. U.S. Department of Health, Education, and Welfare, Washington, D.C.: U.S. Government Printing Office, 1964.

health and research. Personnel in environmental health occupations doubled in the ten-year period, while scientists in health research increased fourfold. In each of the fields of medicine, dentistry, and nursing, manpower increased by about one-third to one-half.

In 1900 there were fewer than 0.2 million college-educated or professionally trained health personnel. By 1960 they exceeded 1.1 million. In earlier years physicians were a relatively larger component of these professional health workers. For every 100 physicians in 1900 there were 60 other health personnel, including 24 dentists, 1 nurse, and 35 other highly trained personnel, including pharmacists.[3] By 1960 the ratio per 100 physicians had shifted to 371 health personnel, including 37 dentists, 208 nurses, and 126 pharmacists and others. That growth has been largely in fields of nursing, pharmacy, and the newer health professions as illustrated in Figure 1.

The changing nature of personal health care since World War II is reflected in the increasing range of comprehensive personal health services which are required for the provision of such care. This is mirrored in the changes in numbers and proportions of health manpower which have occurred since 1950, as can be seen in Table 2.

Physicians

At the end of 1964 there were 297,200 physicians (M. D. and D. O.) to provide medical services for the nation. Included in this count are 21,900 federal physicians in the United States and abroad--12,300 in the Armed Forces, 3,000 in the Public Health Service, and 6,600 in the Veterans Administration. Nonfederal physicians include 272,100 located in the 50 states and the District of Columbia, 1,900 in Puerto Rico and other U. S. outlying areas, and 1,300 with address temporarily unknown to the American Medical Association.

The ratio of total physicians per 100,000 total population has remained at about 150 since 1950, as shown in Figure 2. The supply of physicians has increased about one-fourth and thus has kept pace with the population expansion. Maintenance of the ratio has been possible only through the licensing of large numbers of foreign trained physicians each year during the past decade.

During the 1950-64 interval the ratio of physicians in private practice to civilian population decreased, although increasing in actual numbers from about 168,000 to more than 188,000. As a proportion of total physicians, those in private practice declined from 72 to 63 percent. At the same time there have been marked increases in interns, residents, and other full-time hospital staff,

FIGURE 1. GROWTH OF SELECTED HEALTH PROFESSIONS

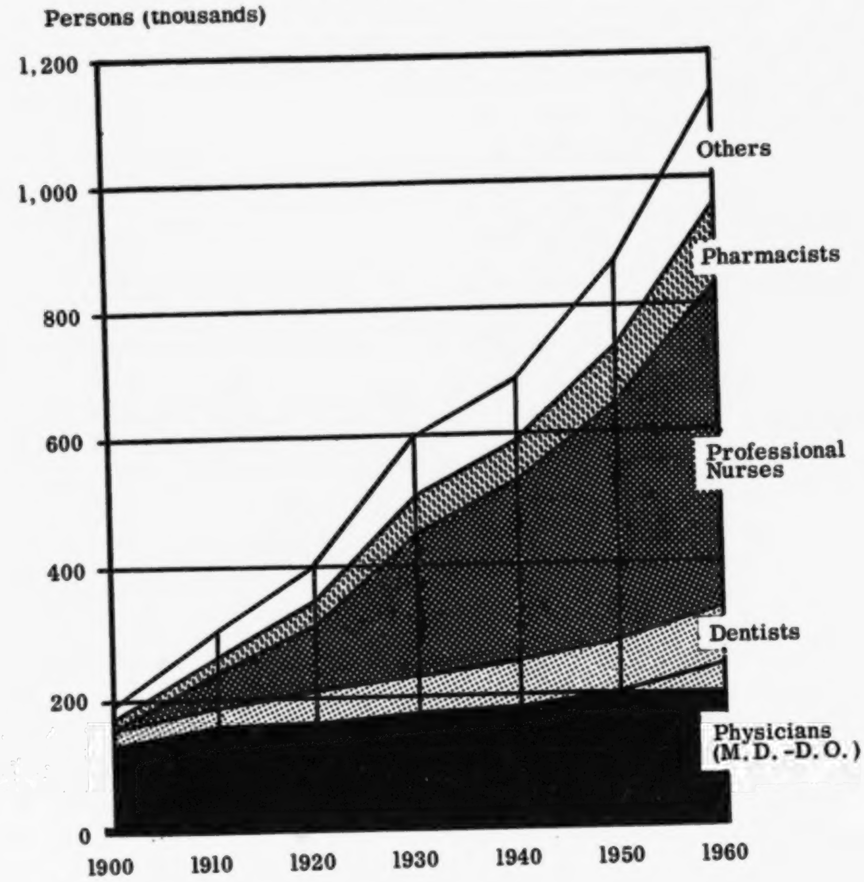
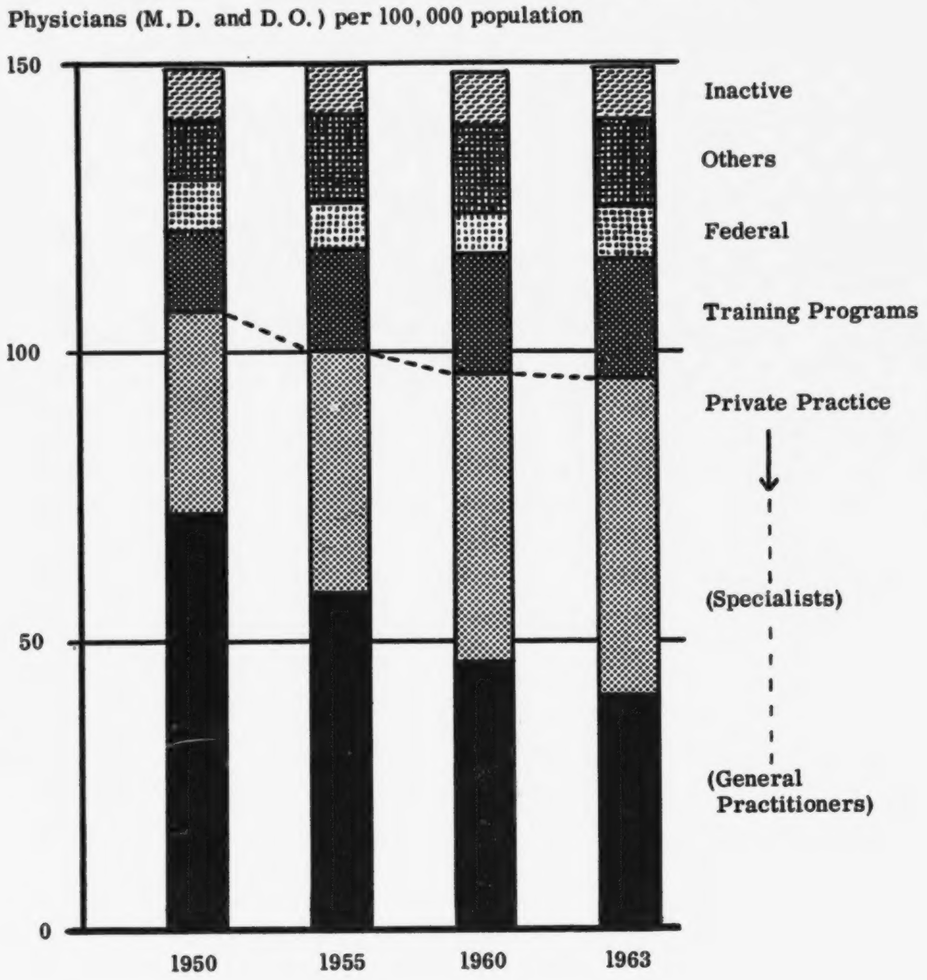


FIGURE 2. PHYSICIANS IN RELATION TO POPULATION



which in part counterbalance services formerly provided by private practitioners. (See Table 3).

Changes in the pattern of providing medical care have also occurred within private practice. (See Figure 3). While decreases in the number of general practitioners and corresponding increases in specialists can be determined, implications of the shift are not clear. From 1950 to 1964, privately practicing general practitioners (M.D. and D.O.) decreased one-third (from about 111,000 to 76,000) while specialists almost doubled (from about 57,000 to 112,000). The number of general practitioners in 1950 was larger than the combined count in 1964 of general practitioners, internists, and pediatricians. (See Table 4).

Many services formerly expected of the general practitioner are being redistributed among medical specialists and other health personnel such as nurses and social workers. It seems likely that general practitioners will be indispensable in many locations for years to come. The goal of continuing comprehensive care for all people, however, seems more likely to be attained through efforts to coordinate specialized services than by attempting to reverse the trend resulting from improvements in the technology of medicine.

Wide regional variations exist in the supply of physicians in relation to population. In 1963 the Northeast region had 178 nonfederal physicians (M.D. and D.O.) per 100,000 civilians, while the South had a ratio of 113. The West and the North Central regions had ratios of 158 and 131, respectively.

Among the states, New York and Massachusetts had the highest physician-population ratios, about 200 nonfederal physicians per 100,000 civilians in 1963. South Dakota and Alaska had ratios about one-third that level.

For both economic and professional reasons, physicians tend to concentrate in metropolitan areas. Such areas are usually characterized by high per capita income and population density and offer opportunities for entree to large hospitals, frequent contact with hospital staffs, and often access to medical teaching centers. Two-thirds of the persons in this country live in metropolitan counties and an additional 16 percent live in counties contiguous to them.

Marked declines appear in the physician-population ratios of progressively less urban county groups, as shown in Figure 4. In the greater metropolitan counties (counties within the Standard Metropolitan Statistical Areas of 1,000,000 or more population) there are 173 active nonfederal physicians per 100,000 population; in the lesser metropolitan counties the ratio is 125. In counties adjacent to these metropolitan counties the lower ratio of physicians may be counter-

TABLE 3. PHYSICIANS BY TYPE OF PRACTICE AND IN RELATION TO POPULATION: DECEMBER 31, 1950 TO 1964

Type of practice	1950	1955	1960	1963	1964
	Number of physicians				
Total physicians (M.D. & D.O.) ---------	232,697	255,211	274,834	289,190	297,136
Physicians (M.D.) -----	219,997	241,711	260,484	276,477	284,271[a]
Private practice ----	158,189	159,371	168,142	174,974	178,528
Training programs ---	21,416[b]	31,028[b]	37,562[b]	38,519	40,964
Federal service -----	12,576	12,957	14,212	18,551	18,329
Other nonfederal practice ----------	16,816	25,197	27.341	29,686	31,780
Retired, not in practice ----------	9,728	11,666	11,820	13,412	13,361
Status not reported -	1,272	1,492	1,407	1,335	1,309
Physicians (D.O.) -----	12,700	13,500	14,350	12,713	12,865
Private practice ----	9,900	10,500	11,034	9,818	9,902
Training programs ---	---	---	729	655	687
Federal service -----	---	---	6	11	16
Other nonfederal practice ----------	---	---	407	208	304
Retired, not in practice ----------	---	---	1,188	1,188	1,211
Status not reported -	---	---	986	753	745
	Percent of physicians				
Total physicians (M.D. & D.O.) ---------	100	100	100	100	100
Private practice ------	72	67	65	64	63
Training programs -----	9	12	14	14	14
Federal service -------	6	5	5	6	6
Other nonfederal practice ------------	7	10	10	10	11
Inactive, no report ---	6	6	6	6	6

TABLE 3. PHYSICIANS BY TYPE OF PRACTICE AND IN RELATION TO POPULATION: DECEMBER 31, 1950 TO 1964
(continued)

Type of practice	1950	1955	1960	1963	1964
	Physician-population ratios				
Total physicians	232,697	255,211	274,834	289,190	297,136
Total population (thousands)	156,472	170,499	185,369	194,117	196,863
Physicians per 100,000 population	149	150	148	149	151
Physicians in private practice	168,089	169,871	179,176	184,792	188,430
Civilian population (thousands)	153,635	167,038	182,348	190,845	193,617
Physicians in private practice per 100,000 civilians	109	102	98	97	97

a/ The net change between 1963 and 1964 is about 2,400 higher than anticipated. The increase is in numbers of graduates of foreign schools--partly a real gain and partly a result of new procedures instituted by the American Medical Association to identify physicians not already in their records.

b/ Interns and residents (federal and nonfederal) as reported in the American Medical Association Directory of Approved Internships and Residencies.

Source: "Manpower in the 1960's." Health Manpower Source Book, Section 18, Public Health Service Publication Number 263. U.S. Department of Health, Education, and Welfare. Washington, D.C.: U.S. Government Printing Office, 1964. (Updated with data for 1964 from the American Medical Association.)

TABLE 4. TYPE OF PRACTICE AND SPECIALTY OF ACTIVE PHYSICIANS: UNITED STATES AND OUTLYING AREAS, DECEMBER 31, 1964

Primary specialty	Number of physicians (M.D.)					Number of D.O.'s in private practice
	All active	Private practice	Other practice		Training programs	
			Non-federal	Federal		
Total	269,601	178,528	31,780	18,329	40,964	9,902
General practice[a]	84,265	67,155	3,801	4,304	9,005	8,704[b]
Medical specialties	58,933	36,524	7,738	4,614	10,057	282
Allergy	867	778	39	20	30	1
Cardiovascular disease	1,796	1,043	365	114	274	3
Dermatology	3,377	2,616	178	164	419	15
Gastroenterology	582	356	86	50	90	0
Internal medicine	36,323	21,898	4,340	3,346	6,739	213
Pediatrics[c]	14,875	9,478	2,232	721	2,444	50
Pulmonary diseases	1,113	355	498	199	61	0
Surgical specialties	81,100	58,120	4,709	4,239	14,032	741
Anesthesiology	8,156	5,755	957	321	1,123	143
Colon and rectal surgery	658	635	9	4	10	50
General surgery	26,353	17,225	1,562	1,707	5,859	246
Neurological surgery	1,931	1,180	192	110	449	4
Obstetrics and gynecology	16,247	12,229	814	679	2,535	69
Ophthalmology	8,100	6,504	271	288	1,037	144
Orthopedic surgery	7,167	5,096	305	506	1,260	58
Otolaryngology	5,227	4,178	164	226	659	[d]
Plastic surgery	1,052	800	41	37	174	1
Thoracic surgery	1,365	873	182	121	189	3
Urology	4,834	3,645	212	240	737	23
Psychiatry and Neurology	19,053	8,791	4,663	1,556	4,043	26
Child psychiatry	680	287	190	10	193	0
Neurology	2,006	706	521	216	563	3
Psychiatry	16,367	7,798	3,952	1,330	3,287	23

TABLE 4. TYPE OF PRACTICE AND SPECIALTY OF ACTIVE PHYSICIANS: UNITED STATES AND OUTLYING AREAS, DECEMBER 31, 1964

(continued)

Primary specialty	Number of physicians (M.D.)					Number of D.O.'s in private practice
	All active	Private practice	Other practice		Training programs	
			Non-federal	Federal		
Other specialties	26,250	7,938	10,869	3,616	3,827	149
Administrative medicine	3,512	0	2,406	1,105	1	0
Aviation medicine	713	38	64	535	76	0
General preventive medicine	795	0	587	179	29	0
Occupational medicine	1,695	421	1,199	59	16	3
Pathology[e]	7,896	1,788	3,408	706	1,994	32
Physical medicine and rehabilitation	999	305	296	212	186	10
Public health	1,521	0	1,302	188	31	0
Radiology[f]	9,119	5,386	1,607	632	1,494	104

a/ Includes no specialty and other specialties not recognized.
b/ Includes 985 with practice limited to manipulative therapy.
c/ Includes pediatric allergy and cardiology.
d/ Included in ophthalmology.
e/ Includes forensic pathology.
f/ Includes diagnostic and therapeutic radiology.

Source: "Manpower in the 1960's." Health Manpower Source Book, Section 18, Public Health Service Publication Number 263. U.S. Department of Health, Education, and Welfare. Washington, D.C.: U.S. Government Printing Office, 1964. (Updated for 1964 with data from the American Medical Association.

FIGURE 3. SPECIALIZATION OF PHYSICIANS IN PRIVATE PRACTICE

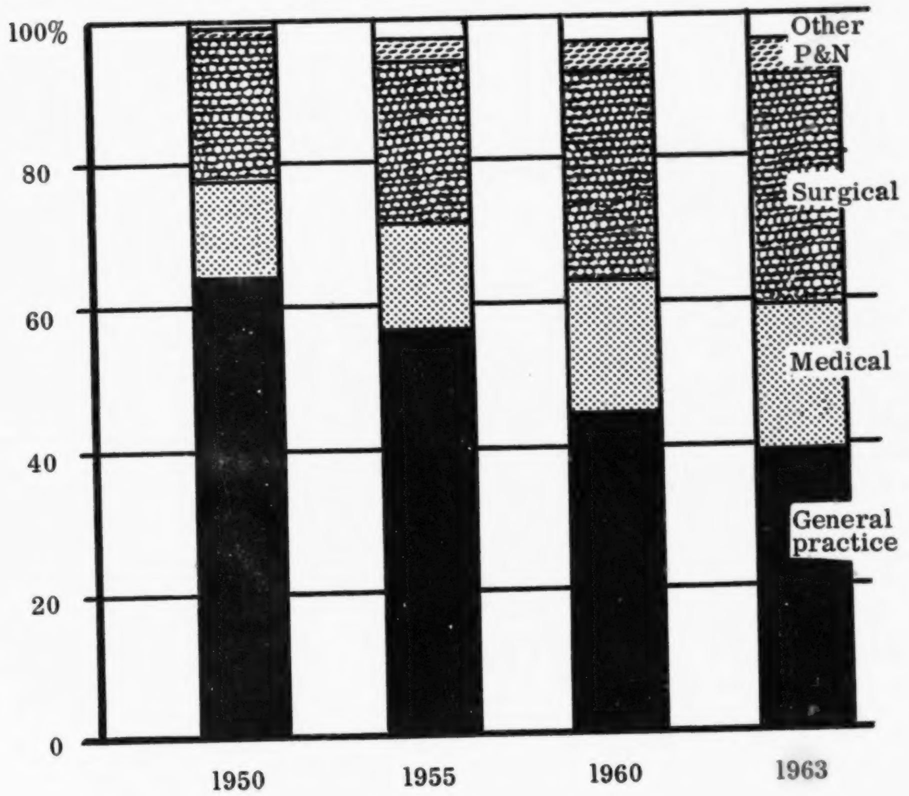
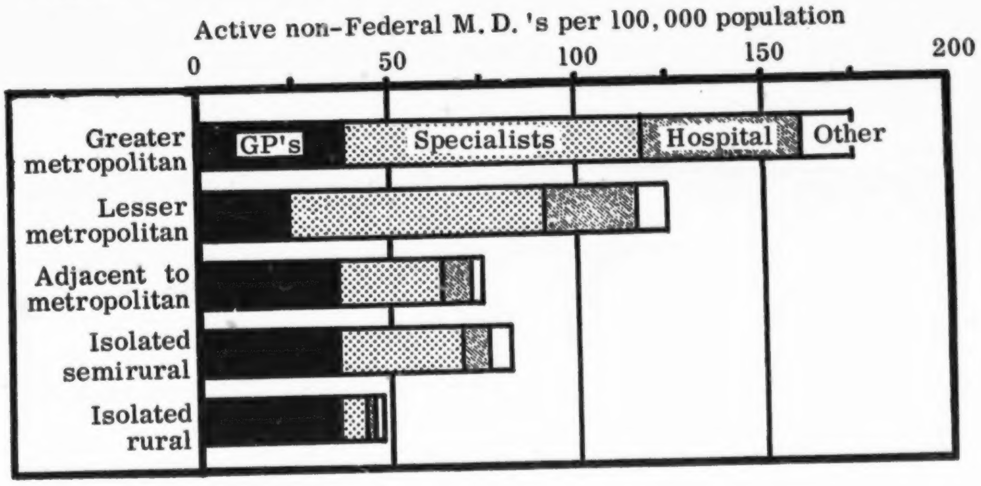


FIGURE 4. URBAN-RURAL DIFFERENCES IN PHYSICIAN SUPPLY



balanced by the accessibility to services in the larger medical centers, but this is not equally true for persons living in isolated counties.

The ratio of general practitioners to population is about the same in each of the county groups.[4] For specialists in private practice, for physicians in hospital services, and for physicians in teaching, research, and industry, the isolated counties are conspicuously low in comparison with the metropolitan areas. Thus as we strive for increased numbers of physicians, we must also strive for more effective distribution of health services if we hope to meet the complex health needs of all citizens, regardless of their place of residence.

The most conservative estimate of the need for physicians is that required to hold the level of 153 physicians per 100,000 population, the national ratio in 1965. In order to maintain this supply in 1975 if the population reaches 232,221,000, the projected need is for 352,000 physicians. The nation's 87 medical and 5 osteopathic schools enrolled 33,595 students in the academic year 1963-64 and graduated 7,627 physicians in 1963. Plans for expanding these 92 schools and constructing about 12 to 15 new schools indicate that the number of graduates may exceed 9,000 by the mid-70's. If no graduates of Canadian and foreign schools were to be licensed in this country after 1965, our U. S. schools would not be able to produce sufficient numbers of physicians to maintain the present ratio to population. (See Table 5).

Selected Allied Health Occupations

From 1950 to 1964, as shown in Table 2, physicians, both M. D. and D. O., increased by 28 percent, roughly comparable to the increase in the overall population of the United States. If, however, one examines the increases which have occurred since 1950 in selected health occupations other than the physicians, one begins to appreciate the changing dimensions of personal health care and the broader overall definition of health. No longer is the concept of personal health care limited to treatment. It increasingly encompasses those broad activities related to prevention as well as rehabilitation. Reflections in health manpower of these significant changes in the concepts of personal health care can be seen in that health educators have doubled, from 600 in 1950 to 1,200 in 1962. Social scientists working in the field of health, and who are to a large degree concerned with motivational and behavioral aspects of personal care, totaled about 500 in 1962. In rehabilitation the increases during this same time period are more startling. Rehabilitation counsellors expanded their numbers from 1,500 to 5,000; occupational therapists from 2,000 to 8,000; physical therapists from

TABLE 5. PHYSICIAN SUPPLY IN 1975 BASED ON NUMBERS OF GRADUATES OF U. S. MEDICAL AND OSTEOPATHIC SCHOOLS AT CURRENT PLANNED GROWTH AND NEW LICENTIATES OF CANADIAN AND FOREIGN SCHOOLS AT THREE LEVELS

Year	Graduates of U.S. medical and osteopathic schools	Deaths among those in the profession	New licentiates graduated from Canadian and foreign schools[a]	Physicians (M.D. and D.O.)		If 1,000 graduates of Canadian and foreign schools are licensed annually after 1965		If no graduates of Canadian and foreign schools are licensed after 1965	
				Number as of Dec. 31	Rate per 100,000 persons[b]	Number	Rate	Number	Rate
1963	7,627	3,700	1,651	289,200	149				
1964	7,700	3,800	1,600						
1965	7,890	3,900	1,600	300,300	150	300,300	150	300,300	150
1966	7,965	4,000	1,600						
1967	8,010	4,100	1,600						
1968	8,065	4,200	1,600						
1969	8,190	4,300	1,600						
1970	8,365	4,400	1,600	327,900	153	324,900	151	319,900	149
1971	8,580	4,500	1,600						
1972	8,805	4,600	1,600						
1973	8,955	4,700	1,600						
1974	9,035	4,800	1,600						
1975	9,185	4,900	1,600	356,900	154	350,900	151	340,900	147

[a] Licentiates graduated from Canadian schools estimated at 200 per year, with balance graduated from foreign facilities.

[b] Population (in thousands): 1963 - 194,117; 1965 - 199,542; 1970 - 214,570; 1975 - 232,221.

Note: These projections have been based in part on first indications of the magnitude of expansion that would come with the availability of funds under the Health Professions Educational Assistance Act of 1963.

Source: "Manpower in the 1960's." Health Manpower Source Book, Section 18. Public Health Service Publication Number 263, U.S. Department of Health, Education, and Welfare. Washington, D.C.: U.S. Government Printing Office, 1964.

4,600 to 12,000; and speech and hearing therapists from 1,500 to more than 10,000. It is recognized that while relative increases are not meaningful in themselves, inasmuch as those areas of health manpower which begin with more limited numbers tend to show much larger increases, they do reflect trends in the characteristics of such manpower and point directions for the future.

Personal health care is increasingly being redefined to include the social and psychological dimensions of illness and health as well as the traditional biological-medical ones. In a sense this is the meaning of the concept of "the total person." Again, this broader definition is reflected in allied health manpower expansion. Social workers working in the medical and psychiatric areas increased from 6,200 in 1950 to 15,000 in 1962. Even this increase does not meet the demand which is occurring, not only in health related social work but also in other fields, as newer concepts of care extend health services to all aspects of daily living. The findings of a 1961 survey of personnel requirements of state and local health departments employing 30 or more full-time personnel illustrate this demand. In the 131 departments which responded to this survey--nearly one-half of the total--it was disclosed that of 165 budgeted positions for social workers, 26 were vacant. Social workers represented nearly double the vacancy rate of the 14 occupations surveyed, 15.8 percent as compared to a 7.7 percent average.[5]

A further indication of this increased concern for the emotional-psychological dimensions of care is the expanded number of clinical psychologists and other psychologists working in health settings, from 3,000 in 1950 to 8,500 in 1962.

Nursing occupations, the largest category in the selected health occupations listed in Table 2, represent over one-half of all health manpower. A virtual doubling of personnel in this category occurred between 1950 and 1964--from 733,500 to more than 1.2 million. The indications are for continued growth in the years ahead.

Registered nurses in practice in the United States numbered 582,000 as of January 1, 1964, an increase of 32,000 since 1962. The 1962 inventory had indicated a total of 847,500 nurses of whom 550,000 were in active practice.

Between 1950 and 1964 the number of employed nurses increased from 375,000 to 582,000. The effective increase, however, was not so large as this increase would indicate because 92,000 of the added number worked only part-time, as shown in Table 6 and Figure 5.

As with physicians and dentists, the Northeast and West regions of the country have the highest ratios of nurses to population--396 and 321 nurses per 100,000 population in 1962. The North Central region's

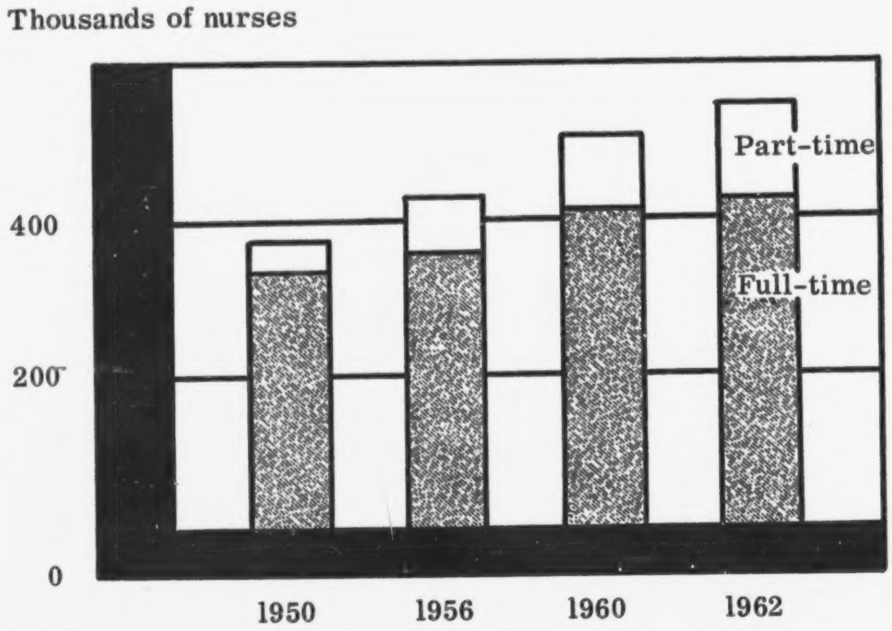
TABLE 6. PROFESSIONAL NURSES IN RELATION TO POPULATION: 1950-64

Year	Number of nurses in practice			Resident Population (000)	Nurses per 100,000 population
	Total	Full-time	Part-time		
1950 ----------	375,000	335,000	40,000	150,697	249
1954 ----------	401,600	---	---	159,825	251
1956 ----------	430,000	---	---	165,931	259
1958 ----------	460,000	---	---	171,922	268
1960a/---------	504,000	414,000	90,000	178,729	282
1962a/---------	550,000	433,000	117,000	184,598	298
1964a/---------	582,000	450,000	132,000	190,092	306

a/ In 50 States and the District of Columbia.

Source: "Manpower in the 1960's." Health Manpower Source Book, Section 18, Public Health Service Publication Number 263. U.S. Department of Health, Education, and Welfare. Washington, D.C.: U.S. Government Printing Office, 1964.

FIGURE 5. NUMBER OF NURSES EMPLOYED FULL AND PART TIME



ratio of 290 is about the national average; the South's 209 is considerably below the national average.

State ratios range between 120 and 502 nurses per 100,000 population. Massachusetts and New Hampshire lead the states. Ten of the 12 states with ratios of less than 225 active nurses per 100,000 population are in the South. New Mexico in the West and Missouri in the North Central region are the exceptions.

The 1,142 schools of nursing enrolled nearly 125,000 students in 1963-64. While the number of schools has decreased from 1,203 in 1950, the number of nurses graduated has increased from 25,800 to 35,300 in 1964. The major decline in schools of nursing is accounted for by the closing of diploma (three year) schools operated by hospitals. The numbers graduating from these programs have remained fairly constant at approximately 26,000 per year for the past decade.

The increase in associate degree programs sponsored by community colleges is dramatic. There were 2,345 students enrolled in 48 associate degree programs in 1959-60 and 6,356 students in 105 programs five years later. The number of graduates with associate degrees has jumped from 252 in 1955-56 to 789 in 1959-60 to 1,962 in 1963-64.

Nurses receiving bachelor's degrees have increased from 3,156 in 1955-56 to 5,059 in 1963-64. They represent 10 percent of all graduates in the former year and 14 percent in the later year.

In 1962-63, 49,500 or 3.6 percent of all 17 year old girls entered schools of nursing. The feasible goal set in 1962 by the Surgeon General's Consultant Group on Nursing calls for 80,000 new admissions to these schools by 1966, or 4.6 percent of the 17 year old girls.

Since 1950, the proportion of entering students who withdraw from schools of nursing before graduation has remained at about 33 percent. At this rate, the 80,000 admissions projected for 1966 will produce about 53,000 graduates in 1969. As shown in Table 7, these graduates are needed to replace losses and to increase the supply to the goal of 680,400 active nurses by 1970. Whether this goal can be attained is yet to be seen.

The most critical need for nurses will be in hospitals and related institutions, where some 525,000 nurses will be required by 1970 according to the Consultant Group on Nursing. Increased need can be attributed in part to an expected increase in the number of general and allied special hospital beds to accommodate an increased number of patients. The 1964 estimate of supply shows 390,400 nurses employed by hospitals and related institutions, including both full and part-time nurses.

Positions in teaching, supervision, and administration progressively

TABLE 7. PROFESSIONAL NURSE GOAL FOR 1970

Year	Estimated number of nurses in practice on Jan. 1	Graduates of U.S. schools of nursing	Net losses among those in the profession[a]	Net additions to the nurse supply
1962 -----------	550,000	31,186	22,000	9,200
1963 -----------	559,200	32,398	22,300	10,100
1964 -----------	569,300	33,400	22,800	10,600
1965 -----------	579,900	33,200	23,200	10,000
1966 -----------	589,900	34,200	23,600	10,600
1967 -----------	600,500	52,000	24,000	28,000
1968 -----------	628,500	50,200	25,100	25,100
1969 -----------	653,600	53,000	26,200	26,800
1970 -----------	680,400	----	----	----

[a] Based on (a) losses through death or inactive status among those in the profession, and (b) gains through return to practice of nurses formerly inactive or addition of foreign-educated nurses. Computed at 4 percent, adapted from NLN method.

Source: "Manpower in the 1960's." Health Manpower Source Book, Section 18, Public Health Service Publication Number 263. U.S. Department of Health, Education, and Welfare. Washington, D.C.: U.S. Government Printing Office, 1964.

require academic preparation beyond the baccalaureate degree. In 1963, 2,766 nurses were enrolled in programs leading to a master's degree and 169 in doctoral programs.

Increases in the numbers of practical nurses have been extraordinary. There were 137,000 practical nurses employed in 1950--250,000 in 1964. During the 1963-64 academic year, 33,128 students were enrolled in 881 (of the 913) approved training programs. There were only one-third as many programs for training practical nurses a decade earlier. These programs, leading to a certificate or diploma, are usually located in vocational schools and hospitals, are most frequently administered by public school systems, and are one year in length.

The Surgeon General's Consultant Group on Nursing concluded that an adequate level of patient care in hospitals would be achieved were 50 percent of the direct patient care provided by registered nurses, 30 percent by practical nurses, and 20 percent by aides who receive on-the-job or in-service training. Even if only this limited demand is placed upon nursing aides, there will be between one-half and three-quarters of a million aides, orderlies, and attendants employed in the nation's hospitals by 1970. These figures compare with a manpower resource that totaled 221,000 in 1950 and 375,000 in 1960.

Probably one of the more startling increases in the overall picture of health occupations is that of homemakers and home health aides. Their numbers expanded during the period 1950-1963 from 500 to 3,900. In view of the health insurance provisions of Social Security (Medicare), it is expected that this category of supportive and personal care services into the home of the individual will expand even more in the decades ahead and their services will become increasingly integrated into the personal health care team.

The New Technology

Along with the increased emphasis since World War II on basic biomedical research is a new and developing technology for the diagnosis, treatment, and rehabilitation of those requiring care. This technological revolution in the medical and health sciences is reflected in the broad range of evolving technological manpower in health. Probably upwards of 85,000 persons are engaged in providing services within the clinical laboratory setting, in contrast to an estimated 30,000 workers in 1950. An additional 70,000 medical x-ray technologists-technicians were employed in 1964, compared with 30,800 in 1950.

Administration

Although administration of community health services is not restricted to personal health care, the increased need for such skilled manpower is reflected in the increase in administrators in hospitals and facilities and programs. From 1950 to 1962, personnel in these areas increased from about 8,600 to 12,500. With the increased emphasis on extended care facilities, the need for qualified administrators should expand. The increase in medical record librarians from 4,000 in 1950 to 9,000 in 1962, reflects a demand for increased integration of records and information concerning individual patient care. The trend in medical records is representative of a similar demand for administrative skills to provide coordination of activities and allocation of resources.

DENTAL OCCUPATIONS

Manpower in dental occupations has increased from 170,400 in 1950, to 221,900 in 1960, to more than 230,000 in 1964. Most substantial increases, both numerically and on the basis of percentages, have been among dental hygienists and dental assistants.

Dentists, like physicians, are not being produced in sufficient numbers to maintain the ratios to population. By mid-1964 there were about 107,800 dentists in the nation, or 56 per 100,000 population. This number includes about 7,200 federal dentists. About 84,800 are nonfederal, professionally active, according to Public Health Service estimates.

A net gain of 20,600 dentists was added to our dentist supply between 1950 and 1964. The number of active nonfederal dentists, however, increased by only 9,500--a number not sufficient to maintain the ratio to civilian population, which declined from 49.9 in 1950 to 44.8 in 1964. (See Table 8).

Dentist-population ratios vary widely from one region to another. The highest ratio is in the Northeast section of the country--58 active nonfederal dentists per 100,000 persons in 1963. The South, with a ratio of 32, is the only region below the national average of 45. Ratios in the West and North Central regions were 50 and 45, respectively.

Dentists, like other health professionals, tend to locate in large population centers, as illustrated in Figure 6. In the greater metropolitan counties there are 70 nonfederal dentists per 100,000 persons. The ratio drops off to 52 in the lesser metropolitan counties, to about

TABLE 8. DENTISTS IN RELATION TO POPULATION: JULY 1, 1950-64

Item	1950	1955	1960	1964
Total dentists[a] ------	87,164	94,879	101,947	107,820
Total population (thousands)---------	152,271	165,931	180,684	192,119
Dentists per 100,000 population ---------	57.2	57.2	56.4	56.1
Active nonfederal dentists -----------	75,313	76,087	82,630	84,800
Resident civilian population (thousands)---------	150,790	162,967	178,153	198,371
Active nonfederal dentists per 100,000 civilians --	49.9	46.7	46.4	44.8

[a] Excludes graduates of the year concerned, but includes all other dentists, active or inactive.

Source: Adapted from a preliminary draft of a report on health manpower statistics prepared by the National Center for Health Statistics, Public Health Service, U.S. Department of Health, Education, and Welfare.

FIGURE 6. URBAN-RURAL DIFFERENCES IN DENTIST SUPPLY

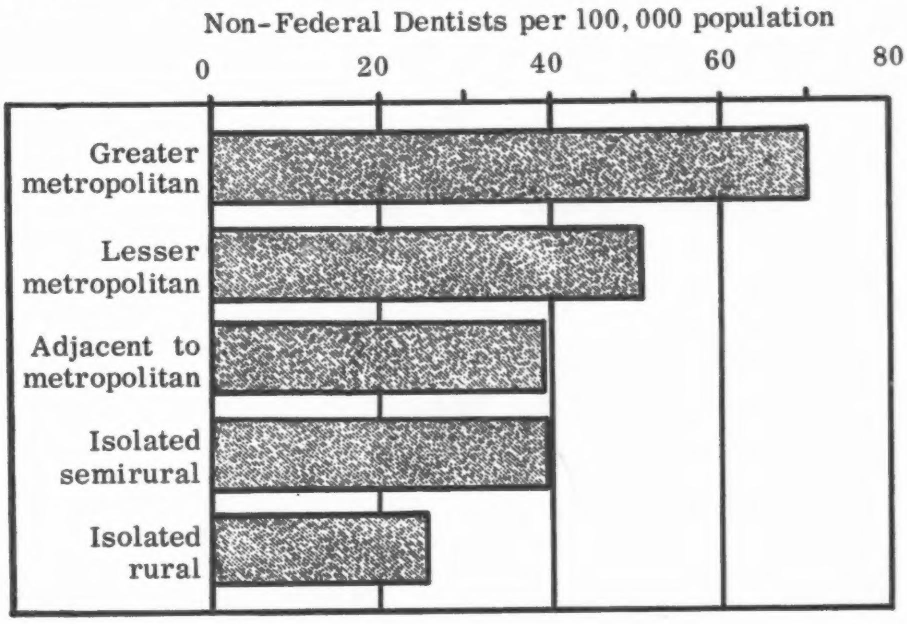


TABLE 9. DENTIST SUPPLY IN 1975 BASED ON NUMBERS OF GRADUATES OF U. S. SCHOOLS AT CURRENT PLANNED GROWTH

Year	Dentists		Graduates of U.S. dental schools[b]	Deaths among those in the profession
	Number as of July 1	Rate per 100,000 persons[a]		
1963 - - - - - -	105,550	55.7	3,243 - - - - - - -	4,055
1964 - - - - - -	-------	----	3,200 - - - - - - -	
1965 - - - - - -	107,935	55.4	3,205 - - - - - - -	10,620
1966 - - - - - -	-------	----	3,215 - - - - - - -	
1967 - - - - - -	-------	----	3,340 - - - - - - -	
1968 - - - - - -	-------	----	3,375 - - - - - - -	
1969 - - - - - -	-------	----	3,395 - - - - - - -	
1970 - - - - - -	113,845	54.5	3,410 - - - - - - -	11,195
1971 - - - - - -	-------	----	3,450 - - - - - - -	
1972 - - - - - -	-------	----	3,590 to 3,725- - -	
1973 - - - - - -	-------	----	3,620 to 3,830- - -	
1974 - - - - - -	-------	----	3,645 to 3,990- - -	
1975 - - - - - -	120,365 to 121,055	53.3 to 53.6	3,665 to 4,200- - -	------

a/ Population (in thousands): 1963 - 189,375; 1965 - 194,671; 1970 - 208,996; 1975 - 225,870.

b/ Excludes Puerto Rico.

Source: "Manpower in the 1960's." Health Manpower Source Book, Section 18, Public Health Service Publication Number 263, U.S. Department of Health, Education, and Welfare. Washington, D.C.: U.S. Government Printing Office, 1964.

39 in adjacent and isolated semi-rural counties, and further to 27 in isolated rural areas.[6] Yet we have no indication of a lessening need for dental manpower as we progress from urban to rural areas. (See Figure 6).

In order to maintain the 1963 ratio of 55.7 per 100,000 population, 125,800 dentists would be required in 1975. The 49 dental schools in this country and Puerto Rico reached a new high of 13,876 students enrolled in 1964-65, but graduates remained at about 3,200. Current plans for expanding existing schools and constructing new ones indicate that the annual number of graduates may range between 3,665 and 4,200 in 1975. This level will not produce sufficient numbers of dentists to meet the above goal. Hence we may expect a decline in dentist manpower in the future. (See Table 9).

While dentists, as shown in Table 2, increased only one-fourth during the period 1950 to 1964, dental hygienists doubled in numbers. Dental laboratory technicians increased by one-fifth.

The number of training programs in dental hygiene accredited by the American Dental Association is increasing significantly with one or more new programs being established each year. Two years of preparation beyond high school are required to complete the requirements for an associate degree or the basic certificate course. The bachelor's degree with a major in dental hygiene requires four years.

The combined numbers of dental laboratory technicians and dental assistants exceed the present number of dentists. The 114,300 individuals working in one or the other of these two occupations are usually trained on the job as apprentices or in brief vocational programs. Future demand for dental services will probably necessitate the effective use of proportionately large numbers of manpower and an upgrading of their skills.

ENVIRONMENTAL HEALTH OCCUPATIONS

As recently as 1950, environmental health manpower consisted largely of engineers and sanitarians. Although these categories still represent key personnel in environmental health, emergence of new problems has created demands for increased numbers and new kinds of scientists and specialists to attack such multi-dimensional problems as air pollution, food protection, occupational health, radiological health, and water supply and pollution.

As shown in Table 2, approximately 28,000 persons were employed in 1962 in the four categories of engineers, sanitarians, specialists, and hygienists. This represented a doubling of personnel since 1950.

The Committee on Environmental Health Problems established by the Surgeon General in 1961 estimated that the total environmental health manpower needed by 1970 would require doubling of the current supply.

HEALTH RESEARCH OCCUPATIONS

A National Institutes of Health study of scientific manpower in medical and health related research in 1960 reported 39,700 professional workers engaged in such research.[9] Almost half (18,000) of these were Ph. D.'s, 11,400 were M. D.'s, D. D. S.'s or D. V. M.'s, and the remainder (10,300) held less than a doctoral degree. When the physicians, dentists, and veterinarians engaged in health research are subtracted from the total, the remaining 28,300 represent the health research manpower in 1960 in addition to the health manpower described previously in this chapter. This represents a fourfold increase from the estimated 7,000 scientific workers in health research in 1950.

The report estimated the manpower requirements for medical and health related research in 1970 at 77,000--39,500 Ph. D. and Sc. D.; 20,500 M. D., D. D. S., and D. V. M.; and 17,000 with less than a doctoral degree. Attrition during the decade ending 1970 will raise the level of personnel requirements to double that of 1960. In other words, more new scientific workers will be required in health research during the 1960's than existed at the beginning of the decade.

HEALTH MANPOWER STATISTICS AND INFORMATION

The limited data available on the numbers and distribution of health personnel nationally may be misleading for regions, states, and local communities concerned with planning and staffing health services in their areas. Despite the information on health manpower resources presented in this chapter, specific and comparable information on each of the types of professional, technical, and auxiliary health workers is not available for each of the 50 states and their communities.

Critical personnel shortages in certain specialties, coupled with the demands for expanded services, require up-to-date information not only on numbers of workers and their distribution but also on the characteristics of available health personnel. Comprehensive information is needed on: characteristics of health manpower (age, sex, race, level of education, etc.); place of principal activity (hospital, public health department, voluntary health agency, etc.); type of principal activity (clinical practice, teaching or research); and source of remuneration (private, governmental or voluntary). Only if such information is available will it be possible to plan health services effectively and to mobilize and allocate manpower resources to assure essential and comprehensive personal and environmental health services in communities throughout the nation.

Fortunately, many groups contribute significantly to collecting information on health manpower resources. The efforts of professional and occupational associations, educational institutions, and voluntary and governmental agencies in this fundamental task should be maximized by the development of uniform and coordinated methods of data collection. Associations representing persons in the health occupations should maintain lists of members and nonmembers, active and inactive, who are qualified for their respective specialties through education and experience. Educational institutions should be encouraged to maintain standard statistics on all students and graduates, so that information is readily available on trends in education of health manpower.

Agencies engaged in the provision of health services should also develop, on a standardized basis, information relating to the effect of patterns of organization on performance of personnel. With such information, comparative analyses of varying methods of using personnel can be undertaken and optimal allocation of manpower resources achieved.

RECOMMENDATION

Despite the important contribution of many groups, the main responsibility for continuing maintenance of uniform statistical data on health manpower resources throughout the nation must rest with the federal government. The Task Force on Health Manpower, therefore, recommends that:

- The United States Public Health Service assume responsibility for collecting and reporting health manpower data on a nationwide basis, using standardized classifications, in cooperation with associations representing health occupations, educational institutions, and voluntary agencies. (Recommendation 4)

NOTES

(*See Bibliography for detailed annotation)

1. Much of the data contained in this chapter is derived from "Manpower in the 1960's."* The updating of many of the statistics appears in a more recent publication, "Health Manpower, 1965."*

2. Estimated numbers in each of about 40 health occupations are available in "Manpower in the 1960's."* In this publication physicians who have an M.D. degree are counted as one unit instead of some 20 to 30 medical specialties as indicated in the 1965 "Health Careers Guidebook."* The latter publication specifies about 200 health careers. Statistics on 125 health professions and occupations appear in "Health Manpower, 1965."*

3. Includes persons who are college educated or professionally trained among those employed as biological scientists, biostatisticians, chiropractors, clinical psychologists, dental hygienists, dietitians, health educators, medical laboratory technologists, medical record librarians, optometrists, podiatrists, rehabilitation counsellors, sanitary engineers, social workers--medical-psychiatric--veterinarians, and therapists--occupational, physical, speech, and hearing.

4. Data are for M.D.'s; similar data for D.O.'s are not available. By definition metropolitan counties are counties within standard metropolitan statistical areas as defined by the Bureau of the Census. A greater metropolitan county is one containing any part of a Standard Metropolitan Statistical Area of 1,000,000 population or more. Lesser metropolitan counties are all other metropolitan counties. Adjacent counties are counties that are not themselves metropolitan but are contiguous with metropolitan counties. All other counties are classified as isolated; semi-rural counties contain an incorporated place of 2,500 or more population, rural counties do not.

5. "Closing the Gap in Social Work Manpower,"*

6. For definition of county groups, see footnote 4.

7. "Resources for Medical Research," p. 5.*

CHAPTER III

Effective Use of Health Manpower

No matter how one regards the problem of caring for the nation's health needs, the requirements for personnel are enormous. Mere maintenance of the current supply of health manpower presents a strong challenge. If the supply of physicians, dentists, and nurses in every state were to be brought up only to the current national average, without lowering the supply in those states that are now above the national average, 35,879 more physicians, 14,223 more dentists, and 65,570 more nurses would be needed.[1]

To tackle the vast unmet health needs of the American people, even greater numbers of health personnel and new kinds of personnel are needed. More chronic illness because of our aging population demands more doctors, more nurses, and more hospital and nursing home personnel. Implementation of the recommendations of the President's Commission on Heart Disease, Cancer and Stroke, three illnesses which account for 70 percent of all deaths in the United States and a great share of disability, will tax our resources of highly skilled medical and allied manpower for the projected network of centers for diagnosis, treatment, and clinical investigation of these major killers. The medical care problems of the poor--the nearly one-third of American families whose annual incomes are less than $4,000 a year--require health personnel of many kinds if the mortality and morbidity from which they suffer are to be brought down to the level of that of the population as a whole.[2]

Our mental hospitals are woefully short of psychiatrists, psychiatric nurses, and other personnel as well. Community mental health programs, as they increase in number and scope, face difficulties in recruiting staff. Although the number of psychiatrists has increased in recent years, approximately 22 percent of all practicing psychiatrists are employed in New York State. California is second with 12 percent. Thus, one-third of all psychiatrists practice in two states with one-fifth of the national population.[3] Trained psychiatric nurses, indispensable in hospitals where psychiatrists are few, have begun to make their appearance only in recent years.

There are enormous needs for dental care: 61 percent of the white population is completely edentulous by age 65;[4] in 1960 it was estimated that the 180 million people in the United States had at least 700 million unfilled cavities.[5] Large unmet needs involving facial deformity and malocclusion accentuate the problem of dental care.

As an illustration of the needs both for manpower and for new methods of using health manpower, one may examine the personnel requirements for periodic health examinations. Although the efficacy of such examinations in predicting causes of death may be limited by present scientific knowledge and diagnostic methods, nevertheless, more and more patients are demanding periodic checkups and specific screening procedures; and physicians are increasingly concerned with health maintenance and preventive medicine.[6] At present, only about 20 percent of the population receive such examinations.[7] A distinguished economist, in discussing the possibility of one two-hour examination per year for each member of the population, states that the cost in time would be 350 million hours or about 40 to 45 hours a week spent by all physicians in practice on this single task. If the examination were done only by general practitioners, the time involved would be much more than all the time available to these practitioners.[8] Even a modest expansion of this service to larger numbers of the population would require a substantial increase in the number of physicians and allied personnel.

Meeting needs for health service depends, of course, on many factors other than manpower--on availability of facilities, on methods of financing medical care, on organization of services. Each of these influences the use of health manpower. Contributions to the effective use of health manpower, along with increased numbers of health workers are essential. The key question here is: How can health manpower be used most effectively? The following measures will contribute significantly to such effective use: prevention of illness and disability; optimal training and use of health-related personnel; rational organization of facilities; technological and administrative efficiency; maintenance of quality of personnel; coordination and consolidation of services; and, planning of services and their staffing.

All these measures are objectives of health service in themselves. Here consideration is limited to the single feature of the impact of each of these measures on the effective use of personnel.

PREVENTION OF ILLNESS AND DISABILITY

Prevention of illness and disability, a primary goal of health service, can, in some instances, effect a dramatic economy in the use of personnel. Control of communicable diseases has freed health service personnel for increasing and time-consuming care of the chronically ill and aged. Adequate prenatal care reduces mental retardation and other defects in children, conditions which require large numbers of skilled personnel of all kinds. Every accident prevented releases health personnel to care for other patients. A significant reduction in the ten million visits to hospital emergency rooms because of injury each year and in the nearly two million hospitalizations of injured persons would accomplish enormous savings in the time of physicians, nurses, and hospital personnel, not to mention the sparing of economic costs and personal suffering.[9]

Marked improvement in dental health can be achieved through one preventive measure that requires no dental manpower--fluoridation of public water supplies. Reduction of dental caries by 50 to 75 percent in children who have drunk fluoridated water since birth frees dentists in fluoridated areas to care for other dental problems.[10] In 1959, 25 percent of the population was covered by fluoridated water supplies. By 1964, 2,612 communities were fluoridating their water supplies and, including the communities with naturally fluoridated water, 54,000,000 people or only 28 percent of the national population were drinking fluoridated water.[11] "At the present rate of instituting fluoridation," it was estimated in 1961, "the goal of 100 percent fluoridation will not be reached for over a century."[12] The initiation of fluoridation in New York City in late 1965 improved the picture considerably. Even if widely instituted in the near future, fluoridation will not permit a reduction in the total supply of dentists needed because of the backlog of dental work in the population, care required for teeth that are retained longer, periodontal disease in older age groups, and the increasing demand for dental care. Nevertheless, fluoridation is a simple means of narrowing the gap between dental need and dental care. Another generation should not grow up without the benefit of fluoridated water supplies. A significant improvement in dental health would thus be effected without using dental manpower.

Many preventive measures, of course, require personnel. Screening tests for diatetes, glaucoma, heart disease, tuberculosis, cervical cancer, hearing and eye defects, dental caries, and other conditions require the time of physicians, dentists, nurses, public health administrators, health educators, laboratory personnel, and other technical workers. Administration of prophylactic penicillin to children with rheumatic heart disease and supervision of these cases to prevent disability require the time of physicians and nurses. Education to effect modification in personal health practices--smoking, diet, exercise--requires the time of physicians, public health nurses, health educators, and social workers. Nevertheless, fewer persons and less skilled persons are required, for example, to carry out an immunization program for poliomyelitis than are required to provide medical care, including rehabilitation, to the victims of the disease. Similarly, the control of tuberculosis has resulted in a decrease of 19,000 beds in special tuberculosis hospitals in the period from 1949 to 1959.[13] If we assume, conservatively, that one person is required to staff each bed, 19,000 persons were released from duty in tuberculosis hospitals to serve in other programs, including mass x-ray surveys for the early detection and treatment of tuberculosis. Preventive measures, early diagnosis and treatment, and rehabilitation may effect only limited savings of personnel. Such measures, however, contribute to good health care and, therefore, to effective use, if not always to economy, of personnel.

Since prevention of illness and disability is an important feature of every program of environmental and personal health service, the responsibility for effective use of health personnel through preventive measures rests with all health workers. Private practitioners, personnel in health departments and other governmental agencies concerned with health, professional organizations, and voluntary agencies all contribute to prevention of disease and disability. The individual recipient of health services must also play a responsible part in prevention.

Reduction of human suffering is justification enough for preventive measures, but the dividend of effective use of health personnel is not to be ignored. Preventive measures may in some cases save health services; in others they may contribute to improved health services. In either event, prevention of illness and disability leads to more effective use of health personnel.

OPTIMAL USE OF ALLIED HEALTH WORKERS

In 1900, for every 100 physicians there were 60 health personnel professionally trained in other fields, including 24 dentists, one registered nurse, and 35 other highly trained professionals including pharmacists. By 1960, the relative numerical importance of nonphysicians had increased so that for every 100 physicians there were 371 other professionally trained health personnel, including 37 dentists, 208 registered nurses, and 126 other highly trained professionals including pharmacists.[14] The ratio of physicians to total health services personnel (professionally trained and others) is approximately one-to-ten--274,800 physicians in a total of 2,589,253 health personnel.

This enormous growth in specialized, health related personnel of all kinds--a response to the complex, interdisciplinary character of modern health services--compensates partly for the short supply of highly trained health professionals and contributes to their effective use.

Among the many kinds of allied health personnel are those who work independently of the physician within the scope of their legal authority and to whom patients may come directly. These include optometrists and podiatrists. Clinical psychologists may work independently or in cooperation with physicians. Others, who may also be professionals themselves, work in close cooperation with physicians and dentists and take direction for the medical or dental aspects of their work from the primary health practitioner. Some functions, such as the role of the nurse in coordinating orders and activities for patients from many departments, are performed independently of the primary practitioner. Included in this large group are nurses, pharmacists, laboratory and x-ray technicians, occupational therapists, physical therapists, dental hygienists, and many others. All these health personnel, whether working independently or as auxiliaries to the primary health practitioner, whether professionally or vocationally trained, relieve highly professional personnel of segments of health service.[15]

The value of allied health workers in saving the time of the physician has long been recognized. Physicians have traditionally extended their services by means of a wide range of auxiliary personnel in their own offices, in hospitals, and through referral to independent practitioners in private offices and laboratories. The participation of nurses, medical technologists, and x-ray technicians in patient care, and more recently of social workers, physical therapists, speech therapists, clinical psychologists, optometrists, and others, is a division of labor that saves physician-hours and at the same time provides technical services by personnel highly trained in one specialty. In the field of mental health, for example, the short supply and maldistribution of psychiatrists can be offset partially by the use of non-psychiatrically trained physicians, clinical psychologists, psychiatric nurses, psychiatric technicians, mental health counsellors, and social workers to bring mental health care to more mental patients than psychiatrists can possibly see.[16] The clergy and members of Alcoholics Anonymous are also filling a need for mental health service.

It would be a mistake to regard the function of allied health personnel as solely to save the time of the physician or other professional personnel. Many highly-trained health workers have a unique competence of their own which, in their specialty, generally is superior to that of the physician or other professional.[17] Many such workers are in short supply themselves, and effective use and extension of their skills require the use of lesser-trained personnel. In nursing, the use of licensed practical nurses and nurse's aides has successfully amplified nursing services.

Similar developments in other specilties could extend services that can be provided by social workers, physical and occupational therapists, teachers of the mentally retarded, and rehabilitation counsellors, to name but a few.[18] For each of these fields, lesser-trained personnel could be developed in larger numbers to perform some of the routine or clerical functions of the more highly prepared health worker: casework aides to assist social workers; assistants for speech therapists to do routine speech drills; occupational therapy assistants; assistants for teachers of the mentally retarded; college-educated housewives trained to provide mental health counselling; homemakers and home-health aides to relieve nurses in the care of the chronically ill and aged. Increased numbers of allied health personnel and of clerical workers and aides to assist them may lead to the most effective use of all health manpower by assuring that the task is done by the person with the requisite but minimum training necessary.

Auxiliary Environmental Health Personnel

In view of the complex problems in control of air and water pollution, radiological health, and toxicology, future environmental health programs will require services of personnel more highly prepared than they are today. At the same time, less highly skilled personnel are needed as laboratory technologists, laboratory technicians, and monitoring personnel. Sanitarians are often over-qualified for the inspection functions they perform in those states requiring a B.S. degree for a registered sanitarian. More effective use of sanitarians might be achieved if they served as supervisors of sanitary technicians trained to perform technical tasks in inspection and monitoring. Employment of persons with varying amounts of scientific training, as needed by the job to be done, would assure the most economical use of manpower.

Auxiliary Nursing Personnel

The nursing shortage would be felt even more acutely than it is were it not for the wide use of practical nurses and nursing aides. In 1962, 225, 000 licensed practical nurses, more than half of whom (127, 000) were employed in hospitals, and more than 400, 000 aides, orderlies, and attendants employed by hospitals and other agencies augmented the nursing services provided by the 550, 000 registered nurses in practice.[19] Under the impetus of recent legislation, increased numbers of practical nurses are being trained. By 1970, it is predicted, there will be 350, 000 active licensed practical nurses, a supply which "would make possible a considerable shifting of care from marginally trained aides to licensed practical nurses."[20]

Hospitals and nursing homes have experimented with various staffing patterns in the use of auxiliary nursing personnel. Irrespective of the merits and demerits of "team nursing" in hospitals or of alternative staffing patterns, it is clear that the increasing utilization rates of hospitals, combined with the shortage of registered nurses, will continue to exert pressure for the best use of nursing auxiliaries.

Public health nursing, by contrast, has made only limited use of licensed practical nurses and nursing aides. Visiting nurse agencies, concerned with providing nursing care in the home, employ practical nurses; and some now employ nurse's aides for personal care and for housekeeping and homemaking services. In health departments, however, which traditionally provide preventive services for patients and families rather than personal care, licensed practical nurses, if employed at all, have been used only for certain clinic duties. Public schools are employing increasing numbers of registered nurses for routine school health functions, many of which could be performed by technical and auxiliary personnel. Exploration is just beginning of the possibility of using auxiliary nursing personnel in conjunction with public health nurses and other registered nurses in staffing a variety of home visiting programs, assisting with some aspects of school health services, and participating in expanding programs of health counselling and screening for problems of chronic illness and aging.

Experimentation with various ways of augmenting scarce public health nursing skills should be accelerated. Encouragement should be given to demonstrations of ways to use auxiliary nursing personnel in public health, school health, and occupational health programs, without lowering the quality of nursing service. In addition to their responsibility for problems of physical health, public health nurses are often called upon to meet, without other professional help, the needs of mentally and emotionally disturbed patients. In such instances, the responsibility of the modern public health nurse in total family health demands selective delegation of tasks that others can do.

Auxiliary Dental Personnel

The case for vastly increased use of auxiliary personnel is nowhere more clear than in the field of dental care. At a time when rising levels of education and income are increasing the demand for dental care, the ratio of dentists to population is declining. From 1950 to 1963, the number of active non-federal dentists declined from about 50 to 45 per 100,000 population. The Commission on the Survey of Dentistry has estimated that merely to maintain the current supply of dentists in proportion to the expanding population would require a 75 percent increase in the capacity of dental schools expected in 1970 and an even greater expansion if allowance is to be made for increasing demand.[23]

Unless the productivity of dentists can be substantially increased, there are not and will not be enough dentists to meet the need. Auxiliary dental personnel--dental hygienists, dental assistants, and laboratory technicians--are the key to increased dental productivity. The Commission on the Survey of Dentistry, viewing the income of dentists as a reflection of their productivity, found that dentists' incomes rise sharply as the number of dental assistants increases. The dentist with one chair and one assistant earned 52 percent more than the dentist practicing in a one-chair office without an assistant. Dentists with two chairs and two assistants had mean net incomes about 63 percent higher than dentists with one chair and one assistant.

Despite this correlation between number of dental assistants and income, the average dentist in May 1962 had less than one dental assistant; about 25 percent of dentists had none.[24] Since dental hygienists are in extremely short supply (the number of full-time equivalents is about 8,000), many auxiliary dental personnel are dental assistants who have been trained in dentists' offices.

The choice is clear. The output of two new dental schools each year, graduating 100 students in each class, must be added merely to maintain the 1960 ratio of dentists to population.[25] Current plans, however, give no basis for anticipating that this need will be met. A significant but realistic increase in the use of dental auxiliaries--a 14 percent increase over 1955--could raise dental productivity by 23 percent from its 1955 level. Melvin L. Dollar states: "If this increase in productivity is realized, it would mean the addition of the equivalent of approximately 24,000 dentists to the supply now expected in

1975."[26] A conservative goal is a ratio of two dental assistants per dentist and a ratio of one technician (either in the office of the dentist or in a commercial laboratory) for every four dentists.

Effective use of dentists depends on both the numbers of dental auxiliaries and the scope of their functions. Effective use of dental auxiliaries depends on the contribution they are permitted to make in dental care. The Commission on the Survey of Dentistry called for a reexamination of the functions of dental hygienists and dental assistants to determine which technical procedures could be delegated to lesser trained personnel.[27] The dental hygienist, whose training is as long as that of the registered nurse, performs functions requiring much less responsibility and skill than those of the nurse--cleaning teeth, patient education, and in some states application of topical fluorides.[28] In 22 states, the dental hygienist is prohibited by law from going beneath the margin of the gum in doing a prophylaxis.[29] "Why," asks the New York State Committee on Medical Education, "should a dental hygienist who can successfully scale and polish teeth below the margin of the gingivae in Michigan be forbidden to do so in New York?"[30]

Authorization to broaden the functions of the dental hygienist is long overdue. Legal restrictions in state dental practice acts should be corrected to permit maximum use of the dental hygienist in relieving the dentist of routine work. Once restrictions in this legislation are removed, studies, demonstrations, and pilot projects should be undertaken to illuminate ways in which the service rendered by dental hygienists and other dental auxiliary personnel can be extended. The issue in dental manpower is not what should be done to make effective use of the short supply of dentists, but how quickly enough dental auxiliaries, with broadened functions, can be trained and integrated into the pattern of dental services.

Principles for Effective Use of Auxiliary Personnel

Basic to the successful use of auxiliary health personnel is the need for a fresh and continuing scrutiny of all health functions to determine which can be satisfactorily allocated to auxiliary personnel with varied kinds and amounts of training.[31] In health agencies, job analyses, consisting of detailed study of health services and division of specific functions into component tasks, can permit workers with a limited range of skills to be drawn into the manpower pool to increase the productivity of highly skilled personnel.

Nursing illustrates the benefits that can be derived from such job analyses. The time of school nurses is now largely consumed by routine tasks which could be assigned to auxiliary personnel; yet a high degree of public health nursing skill is employed cooperatively with other members of special service teams to cope with the physical and emotional problems of school children. An objective analysis of the use of nurses in schools should not be directed towards decreasing their number but rather towards upgrading their role to fit the needs of the important school-age group they serve.

In many clinical services, both nursing and medicine have identified a role for an expert nurse to provide support and supervision of certain segments of patient care now inappropriately staffed. Some obstetricians see an expanding role for the nurse-midwife as one solution to the problem of medical manpower in maternity care and as a means of obtaining more broadly prepared nurses to supervise the hospital's maternity service.[32] The Surgeon General of the U. S. Public Health Service, Dr. W. H. Stewart, envisions the future possibility of having specially trained nurses or medical assistants (trained like Army medical corpsmen) handle normal deliveries.[33] Increased independence for the highly prepared expert nurse offers immense potential for improving patient care. Achievement of the rewards of conservation of skilled personnel and improved services will require a positive orientation towards innovation in the use of manpower.[34]

Second, review is required of the proper legal scope of the authority of allied health personnel and of the responsibility of primary practitioners for the acts of such personnel. Harmonious interdisciplinary relationships between existing and emerging health professions and disciplines will be of critical importance. Ophthalmologists and optometrists, psychiatrists and clinical psychologists, public health nurses and social workers, environmental health specialists and sanitarians must exchange information and consult on specific cases. As new specialties take form in an effort to realize the potential offered by scientific and technological breakthroughs, one can anticipate additional careers. Few, if any, new disciplines confine their activities or interests solely to new techniques and roles. Overlap in functions can thus be expected.

Since most established professions tend to be conservative in orientation--a desirable trait when viewed as an effort to safeguard standards and enhance quality--these groups are naturally reluctant to share functions or responsibilities previously recognized as their sole prerogative. This reluctance may create conflicts between old and new professions as each seeks the same end--patient wellbeing or a healthful environment--by different means. Resistance to pressure for change can be even more difficult to overcome when the status quo is firmly imbedded in a multiplicity of statutes, accreditation procedures, and criteria for certification. Economic vested interests, supposedly a hallmark of guilds rather than of professional groups, add to the resistance to change. In such situations, the forces of logic and rationality may be no match for tradition and vested interests. Nevertheless, rationality must prevail if effectiveness, efficiency, and economy in health manpower are to be achieved.

Third, effective organization and supervision of the services performed will be required to implement the use of allied health personnel. The health establishment comprises a variety of institutions and agencies, e.g., hospitals and nursing homes, offices of physicians and other health practitioners to whom the public has direct access, health departments, air and water pollution control districts, voluntary health agencies, and many others. In each of these health facilities, sound organization and adequate supervision at each level of service will assure that quality of care is not jeopardized by measures to stretch health manpower.[35]

RATIONAL ORGANIZATION OF FACILITIES

The largest number of health personnel work in hospitals, and institutional arrangements determine in large measure the pattern of work of all health personnel. Effective use of personnel depends on the rational organization of these facilities to permit the most efficient work flow, to save travel time, and to distribute personnel where they are needed.

The Task Force on Health Care Facilities has presented a thorough analysis of the organization of facilities, including significant problems relating to staffing and personnel. That Task Force has examined, from the vantage point of the health facility and its effective operation, the trend towards organization of the physician's time, reassignment of skills and responsibilities, centralization of skilled personnel, and interchange of personnel among institutions. Here, the focus is on the health worker and ways in which the organization of health facilities impinges on his productivity; on patterns of work in private ambulatory care facilities, public ambulatory care facilities, and inpatient facilities.

The organization of medical practice reflects an evolutionary process which has produced gradations extending from the traditional solo office at one end of the range to the large-scale group at the other. In between are numerous variations evolving from within the medical profession as a series of adjustments to the demands for rationalization imposed by the burden of work.

Physicians and dentists in individual practice are increasingly organizing their offices to make the most effective use of their time. Employment of clerical personnel, office nurses, and auxiliary dental personnel, as discussed above, is a time-saver for the highly-skilled professional. Most physicians work with a number of colleagues in various specialties to whom they refer patients.

The location of physicians in medical arts buildings and medical plazas has traditionally been used as a means of organizing the physician's practice more effectively.[36] Within the same building or area a variety of medical specialists and other kinds of health personnel, including laboratory technicians and pharmacists, can be housed. This ready access to consultants and to supportive services, with appropriate organizational arrangements, heightens the effectiveness of the individual practitioner. Common facilities and staff shared by practitioners in a medical arts building give the individual practitioner more and better resources for his practice than he might be able to provide for himself alone. The location of medical arts buildings and medical plazas close to hospitals saves travel time, and in some specialties, as in obstetrics, may be a distinct advantage to the physician and the patient.

Physicians are also associating themselves in diverse ways to achieve a division of labor, to provide specialists' services, and to find relief from the burdens of overwork and continuous duty. These include various arrangements to secure coverage for weekends and vacations, to purchase ancillary services on a regular basis, and to associate with other physicians for specific purposes. An inevitable concomitant of the pronounced drive toward specialization (today 69 percent of all active physicians outside the federal government are full-time specialists[37]) has been an increase in teamwork. Teamwork, organized in various ways, heightens the effectiveness of the individual physician by giving him access to a range of specialists and opportunity for frequent consultation. Proper consultation can also avoid wastage in the use of allied health workers, e.g., wastage in laboratory personnel occasioned by blanket ordering of numerous laboratory tests in a case in which the specialist could pinpoint the essential tests.

One form of teamwork is group practice.[38] In 1959 there were 1,154 multi-specialty groups of three or more physicians as compared with 368 in 1946, a three-fold increase.[39] The number of physicians working full-time and part-time in multi-specialty groups also tripled during this period, with 11,447 physicians engaged in group practice in 1959. Physicians in such groups comprised 9.2 percent of all physicians in private practice in 1959. By 1962, the number of groups had risen by 18 percent above the 1959 level with 21,840 doctors, or

12.8 percent of all physicians in private practice, engaged in group practice.[40]

Association of physicians in group practice can facilitate the effective use of health manpower in several ways. Adequate clerical staff can be hired, thus freeing the physician from administrative and clerical detail, which is becoming more burdensome with the increase in third-party payments. A wide variety of health workers can be employed by several physicians jointly. The 1959 Survey of Group Practice reported the following personnel employed: registered nurses, licensed practical nurses, nursing aides, x-ray and laboratory technicians, physical therapists, social workers and, for some groups, dietitians, medical record librarians, opticians, optometrists, clinical psychologists, x-ray and laboratory aides, optical technicians, occupational therapists, medical artists or photographers, industrial hygienists, biochemists, etc.[41]. Sharing capital costs of buildings and equipment makes available better facil- and a wider range of expensive tools than the physician working alone can usually afford or use efficiently. In group practice, the possibility of interchanging responsibilities permits physicians to have time off for continuing education and refresher coures more easily than in other arrangements for medical practice. Some evidence exists that the physician in group practice can care for a larger number of patients than the solo practitioner. One study found that the average physician in nongroup practice has a daily patient load of 13.7 people, while for the average physician in group practice the daily patient load is 21.9 people.[42]

The President's Health Message of January 7, 1965, viewed comprehensive group practice as a means of stretching the supply of medical specialists and of widening the range of medical services provided in communities. It, therefore, called for loans and guarantees to assist voluntary associations in constructing and equipping facilities for comprehensive group practice. As the Somers have said,

"...We can expect little, if any, further increase in productivity through the doctor working harder or faster. This process may have already passed the point of diminishing returns. The only promising method now lies in better organization--augmenting the individual doctor's skills and capacities with institutional arrangements whose efficacy has already been demonstrated."[43]

Group practice is less common in dentistry than in medicine, but association of dentists in groups also permits dentists to specialize and function at their highest skills. Dental auxiliaries can be efficiently used on a full-time basis, and dentists in group practice can more readily arrange for continuing education and postgraduate training than dentists practicing alone. Especially for the young dentist, whose time may not be filled in his beginning years of practice, association with other dentists tends to put him fully to work at once. At the same, association with experienced dentists compensates for the lack of a residency program in dentistry and thus accelerates the acquisition of dental skills.

A variety of ambulatory care facilities is now available to the public: outpatient departments of general hospitals; health department clinics for prenatal care, treatment of venereal disease, and immunization; clinics under other auspices for the diagnosis and treatment of specific disease (e.g., alcoholism, cancer, heart disease, etc.); child guidance clinics; community mental health centers; day and night care centers for mental patients; rehabilitation centers; dental clinics; and others.[44] Patients are increasingly turning to hospital outpatient departments for ambulatory care, and physicians sometimes prefer to see patients at the hospital rather than in their offices. Dr. E. Richard Weinerman has documented the importance of hospital outpatient departments in the provision of medical care:

"Hospital outpatient departments now provide a significant proportion of all ambulatory care in the United States. In 1963 over 40 percent of the 7138 registered hospitals reported outpatient clinic services, and more than 80 percent maintained emergency facilities. Some 118,000,000 visits were reported in all, of which about half were general clinic visits, over one quarter were emergency room visits, and the remaining 20 percent were referrals for special services.

"Projections for the decade 1960-1970, made by the Public Health Service, presage a steady, though disproportionate, increase in the volume of all three types of outpatient care. Holding constant the effect of population growth, the ten-year increase is expected to be 79 percent for emergency services, in contrast to 18 percent for all outpatient visits and 8 percent for inpatient admissions. At this rate of overall increase hospital outpatient facilities will provide almost one-sixth of all ambulatory service rendered in the country."[45]
Such anticipated growth accentuates the need for more effective organization of all ambulatory care facilities so as to achieve their efficient use of the large numbers of personnel of all kinds who staff them.

Location of ambulatory care facilities to minimize travel time can contribute to the effective use of highly skilled personnel who serve part-time in clinics. Physical proximity of hospitals and health departments, where feasible, permits service by busy physicians and other personnel in both kinds of facility. One dietitian may be able to work in a hospital and in a public health program as a public health nutritionist, where the two facilities are close together and adequate auxiliary personnel are available. Wise location of facilities can not only save travel time and permit dual functioning of personnel, but it may also facilitate continuity of care. The same personnel can care for a baby when he is well and when he is sick. Public health nurses can start maternal and child health visits on the maternity service and continue them in the community.[46]

If outpatient facilities cannot be located close to one another, coordination of facilities can contribute to the effective use of personnel. Ambulatory care facilities should serve patients referred by both governmental and private agencies.

The increasing organization of mental health care in the community represents a significant force for the effective use of personnel, as well as for improved care of the mentally ill. In 1962, 1,683 community mental health clinics served 741,000 patients--almost double the number served in 1955.[47] Community mental health centers require not only psychiatrists, but general practitioners, clinical psychologists, psychiatric and public health nurses, social workers, and mental health counsellors who can assume some responsibility for patients, provided psychiatric consultation and supervision are available.[48] Day and night hospitals require nurses and therapists of various kinds (physical, occupational, and recreational), but volunteers who are properly trained and supervised can be of substantial help. Even with the variety of personnel needed for these patients, fewer persons are required for care in the community than for adequate staffing of inpatient mental hospital care. Not only are fewer custodial personnel required, but highly-qualified psychiatrists who would not be available for work in a residential facility can be obtained on a part-time basis.

The same principle of care in the community that is developing with such promise in the field of mental health could be extended to other aspects of health service. Many diagnostic procedures now carried on by hospitalizing the patient could be done on an outpatient basis if ambulatory care facilities were organized to handle them and if their costs were covered by insurance. These include clinical laboratory determinations, roentgenography, and such specialized adjunctive tests as encephalography and electrocardiography. Hospitalization even for one or two days for these procedures is an extravagance in the use of hospital personnel, as well as hospital beds, that could be avoided with proper organization of ambulatory care facilities.

Two of the most important facilities impinging on the effective use of personnel are hospitals and nursing homes. The organization of hospitals can encourage effective use of personnel, and the location of hospitals can effect equitable geographic distribution of health manpower.

In the postwar years, substitution of office visits, care in hospital outpatient departments, and hospitalization, for home calls has contributed to effective use of the physician's time. The shortage of physicians and new medical technology brought about this change, and insurance coverage facilitated it. In certain cases, however, house calls are essential, and proper community planning can assure the provision of necessary house calls. Arrangements by group practice units, hospital-sponsored home care programs, and visits by public health nurses to assess the patient's condition can fill the need for home visits and still use the physician's time efficiently.

Further rationalization of the physician's work in hospitals could be achieved, if his hospital appointments were not dispersed among several hospitals, requiring time spent in travel every day. The rotation of individual doctors among several similar hospitals wastes valuable professional time. In view of the full utilization of hospitals, however, it may be necessary for the physician to have several hospital appointments in order to serve his patients. But it is unrealistic and inefficient, as the Task Force on Health Care Facilities points out, to expect the physician to be the connecting link in a multi-hospital community.

Physical location of facilities for extended care and rehabilitation near general hospitals, with common use of staff, should be encouraged as a measure contributing to effective use of personnel. A closer working relationship between the professional nursing staff of the extended care facility and that of the hospital can improve application of professional skills. Expansion of care in nursing homes and other extended care facilities by reason of the enactment of health insurance for the aged will bring to the fore the question of the quality of care these institutions and programs provide. Greater interchange of personnel between general hospitals and such facilities can contribute to improved care.

Development of coordinated home care programs for the chronically ill and aged and for those with other illnesses who do not need hospital care is a means of bringing the services of a team of specialists to the patient at home. In 1960, there were 40 such comprehensive programs and 25 additional programs with limited services.[49] Although their growth has been slow, home care programs may increase in the future. Hospitals, beset by shortages of beds and nursing personnel, may recognize the therapeutic, rehabilitative, and financial advantages of such programs and may increasingly extend the reach of the hospital into the community in this way. In substituting home-health aides or rehabilitation aides for registered nurses, home care programs relieve hospital nursing personnel of the burden of 24-hour care.[50] The broad array of personnel needed (and the travel required of them) may, however, be a barrier to the development of home care programs, although one leading hospital director sees hopeful aspects of the supply of personnel for these programs:

> "The problem of personnel shortages has, however, a more hopeful aspect. It is now being recognized that home care offers certain job opportunities that may attract former paramedical personnel back to the field rather than divert members of existing working groups away from other essential tasks. By the nature of the service, the hours of work are not rigidly predetermined. In many instances, calls may be made at times mutually convenient to the household and the member of the service team. Professionals who have retired from the field because of family responsibilities may welcome the opportunity to resume part-time work with flexible hours. Full-time employees (e. g., physical therapists) may have sufficient time available as part of their regular jobs, with proper arrangement of work schedules, to serve the needs of a home care program. Supervisory personnel (e. g., social service, visiting nursing) may be able to direct the activities of field workers within the compass of their assigned duties. Such accommodations, which have been made by most of the present programs, indicate that personnel shortages usually can be surmounted if other factors favoring establishment of the program are present.
>
> "A potential bottleneck in many communities is the lack of trained homemakers or housekeepers. In 1958 only 143 agencies in the United States provided homemaker services, employing 1700 homemakers and serving 2200 families. Perturbed by inadequacy of services in relation to obvious needs, 8 units of the Department of Health, Education, and Welfare and 26 national voluntary agencies sponsored a conference on homemaker services early in 1959, to draw up precise definitions and to recommend criteria for planning, establishing and financing homemaker service programs. As a result of this purposeful activity, it may be expected that organized homemaker services will be established and expanded in many more communities in a variety of settings--

> public and private family and children's agencies, visiting nurse associations, hospitals, or self-contained organizations formed solely to provide the service. The end result will be to remove a potential obstacle to the growth of home care programs."[51]

These programs will certainly represent an effective use of scarce manpower if experienced personnel not now actively engaged in health service can be drawn back into active work in coordinated home care programs. If not, they may still be worth the price in allocation of personnel in return for the many other advantages afforded to patients and hospitals.

Effective use of personnel involves not only increasing their productivity by various means but also locating them throughout the country in proportion to population, not solely in relation to purchasing power. Rural-urban differences in the supply of health personnel characterize every occupational group. Although the ratio of physicians in general practice to population is about the same in rural and urban areas, the ratio of specialists to population in rural areas is half that of urban areas, and the ratio of hospital staff, interns, and residents is one-quarter that in urban areas.[52] Ratios of nurses to population also vary greatly among states and regions.[53] The location of large hospitals and medical centers is a significant determinant of this disparity.

In dealing with the special problems of rural areas, the Task Force on the Organization of Community Health Services has outlined a regional approach to the provision of rural health services that recognizes the special needs of individual communities. An inducement in recruiting staff for rural health services is the assurance of facilities with all the scientific resources for practicing modern medicine. Since a full range of scientific resources cannot be provided in every rural community, the most fruitful alternative is a regional system of hospitals, whereby small community hospitals are linked with hospitals in larger centers and in turn with a large university hospital or medical center. Improved transportation facilitates regionalization because patients can travel farther than formerly to obtain care by specialists. A regional system of hospitals has many features that contribute to effective use of personnel: opportunity for consultation and diagnostic assistance; sharing of pathologists and radiologists; centralized laboratory services; access to highly trained auxiliary personnel; and opportunities for continuing education. For the areas of the country where shortages of health personnel are most acute, regionalization of hospitals provides a useful approach towards more effective use of personnel as well as recruitment of new personnel.

TECHNOLOGICAL AND ADMINISTRATIVE EFFICIENCY

The vast amount of biomedical and technological research that is revolutionizing the diagnosis and treatment of disease has as a by-product far-reaching implications for the effective use of health manpower. The work of the nearly 40,000 professional and scientific personnel engaged in medical and health-related research[54] is increasing the effectiveness of health personnel to a new order of magnitude. Better diagnostic tests and methods, improved instruments, electronic devices, new and more effective drugs, and better therapeutic methods generally are opening short-cuts to better health care.

In laboratories, hospitals, and other health facilities, automation is creating new possibilities for reinforcing personnel by technology. New laboratory instruments have been produced which save up to 90 percent of the laboratory technician's time. Electronic data processing systems are becoming more widely used to collect, record, store, retrieve, summarize, and transmit data concerning patients and administrative matters. Although requiring new kinds of personnel for programming, such systems will undoubtedly reduce the workload of professional, clerical, and administrative staffs. The application of industrial engineering and architectural innovations to health facilities will enable the same numbers of personnel to provide improved care with increased effectiveness.

In dentistry, the introduction of high-speed drilling equipment has significantly increased the productivity of dentists. Although the Commission on the Survey of Dentistry cautioned that it is impossible to measure accurately changes in productivity, it stated that "the widespread acceptance of high-speed equipment could itself result, by 1975, in a saving of professional time equivalent to that of 2,000 dentists."[55] New anaesthetics, high velocity evacuation of oral fluids, and other scientific and technological developments, some of which are already projected, could effect additional savings in professional time.

In nursing, registered nurses employed by boards of education still perform and record individual screening tests for large groups of school children. Several states have demonstrated that technically prepared personnel working with technologically advanced equipment can be used efficiently in mass screening programs, thus saving the skills of the nurse for tasks which she alone can perform. Despite the shortage of nurses, many are still engaged in clerical work and other routines that could be carried on by technicians working with modern equipment. The use of ward secretaries in hospitals and, more recently, of "lay managers" demonstrates the successful transfer of non-patient functions to persons other than nurses.

In pharmacy, technological developments have revolutionized the dispensing of medication. No longer must each prescription be individually compounded and prepared. Standardization of dosages and prepackaging of drugs by pharmaceutical houses enable a single pharmacist to supervise drug store clerks in the conduct of a volume of business which formerly would have required several qualified pharmacists. Technological developments have also represented a vast saving of time for nurses, who formerly spent untold hours in preparing medications ordered by physicians.

In environmental health, the conquering of technical problems and the routinizing of procedures have released personnel to tackle unsolved problems. Establishment of modern water treatment plants and their maintenance by technically trained personnel permit professional personnel--engineers and other scientists--to address themselves to new problems of pollution and water resources. Development of smog control procedures for factories and automobiles permits scientists and engineers to undertake further research and expanded technical assistance to communities. Since only 2 percent of the nation's pool of scientific manpower is engaged in environmental health and by 1970 the best expectation is that only 2.6 percent will be so engaged,[56] it behooves us to find ways of reserving the most highly qualified professional personnel for research and experimentation with measures to control environmental hazards. Skilled personnel should not collect water samples in a single environmental health program. Scientific personnel should not be used for administration where non-scientist administrators can do the job.

Administrative efficiency also contributes to the effective use of personnel. It is elementary that good office management in an individual practitioner's office, in a complex hospital, or in a public health program can save time for professional personnel. Increased use of auxiliary staff entails a continuing review of the tasks that can be performed adequately by personnel with limited training--a task that requires informed, imaginative, and influential administration in all community health agencies, institutions, and programs.

Sound administration, moreover, contributes to high morale of employees and provides an organizational atmosphere favorable to satisfying the needs and aspirations of personnel of all levels. Administrators who are alert to the psychological needs of employees can develop personnel practices, techniques of communication, and rationalization of tasks that upgrade the performance of the health team.

The need for administrative personnel specially trained for the health services goes beyond good office management and efficient division of labor. It goes to the question of responsibility for organizing and operating preventive and curative programs of health services that are increasing in numbers and in complexity. Who is to administer these programs? Until now, top-level administrators have generally been physicians, whose years of clinical training do not necessarily equip them for handling problems of social organization and whose functioning in this role is a costly use of scarce and specialized medical talents.[57] In hospitals, by contrast with medical care programs, administrators are increasingly non-physicians with training not only in hospital management but in health service needs and methods. The role of the physician in such a setting is increasingly reserved for medical decisions. The experience of using highly qualified administrators to provide progressive hospital administration, with physicians as medical advisers, could well be adapted for other programs of community health service.

Expanding and diverse programs of organized medical care have accentuated the need for qualified health service administrators. It has been estimated that there are about 5,000 positions in medical care administration alone in the United States which at present are filled in large part by "persons... (who) have stumbled into the field from paths originally directed towards other goals."[58]

In urging the training of non-physician medical care administrators for the mushrooming programs of organized medical care, Dr. Milton I. Roemer has suggested the need for health service administrators with "sophistication in the social and administrative sciences as well as the sciences of the human organism."[59] In his view, "The challenge... is to train adequate numbers of professional personnel in sufficient breadth and depth to be equal to the tasks of modern community health service administration. To insist on physicians as the sole candidates for all such training is socially wasteful. Their years of laboratory, theoretical, and clinical training have equipped them well to treat sick individual patients; to have them abandon this function and then only begin to learn about the process of social organization and administration is an extravagance. Yet, the young non-medical baccalaureate cannot acquire the knowledge and maturity for top health leadership in a one-year master's degree program in public health."[60]

Administrative efficiency as a means toward effective use of health personnel requires, in the large and expanding world of organized health services as in the hospital world, the development of qualified administrative personnel prepared at the doctoral level in the social and scientific aspects of health service. Effective leadership is possible only if professional training goes beyond technical competency. This is a mandate for administration.[61]

MAINTENANCE OF QUALITY OF PERSONNEL

Ultimately, the value of personnel depends on the quality of their produce. Poor medical care is a waste of the time and effort of health personnel. Good medical care is their raison d'etre. A well-trained, up-to-date physician, working with every assistance that modern scientific medicine can provide, can cure patients faster and better--an observation that is no less relevant for other health professionals and allied workers. Maintenance of high-quality personnel can, indeed, compensate to some extent for shortages in numbers.

Education for the health services is the fundamental determinant of the quality of health personnel. In the postwar years, continuing education in all fields has become indispensable for keeping abreast of new developments. Short-term courses and special programs proliferate in all specialties. Continuing education has become essential to medical practice--so much so that an official of the American Medical Association has suggested that it be encouraged further by publishing the names of physicians participating in programs of continuing education and by making membership in medical societies contingent on such participation.[62]

State licensure laws prescribe minimum qualifications for personnel and set forth their legal authority. The minimum standards fixed by these statutes protect the public, but variations in statutes from state to state may result in inequalities in standards and may impede the movememt of personnel across state lines to areas of need. Moreover, as new knowledge is gained and education is improved, licensing statutes should be amended to raise the standards required. National minimum requirements for licensure of personnel in all the health professions and occupations should be established, with freedom for the states to set higher standards to meet their individual needs. Determination of standards appropriate for each specialty will require a systematic and objective analysis of present licensing requirements in light of education and functions in all the health professions and occupations.

The need for medical supervision of many health workers is generally met by limiting their functions, e.g., optometrists may not prescribe drugs. If, as seems likely, these health workers are to assume increasing responsibility for providing health services, then legal regulations and organizational procedures for guaranteeing medical supervision should be scrutinized. Medical supervision is particularly important in the case of those health workers to whom the public has direct access. In organized health services, such as hospitals, health departments, and physicians' and dentists' offices, medical supervision is built into the organizational structure,[63] but the same protection may not be provided for a patient who consults an independent allied worker.

Attention should also be directed to the licensure and operation of cultists and unofficial practitioners in the health field who exist alongside scientific, accredited personnel. Medical cultists, whose training does not include education in the basic biological sciences and whose procedures may border on quackery, endanger the health of patients not only by dispensing unscientific treatment but also by delaying proper medical care.[64] Moreover, they waste manpower. These practitioners might better serve as auxiliary health workers after scientific training. Unquestionably, a continuing war should be waged on outright medical quackery along the lines proposed by the National Congress on Medical Quackery sponsored by the American Medical Association and the Food and Drug Administration.[65] As for cultists and others whose practice does not follow scientific principles, continuing and energetic efforts should be made to increase public understanding of the dangers that can come from substitution of unproved and unscientific methods of treatment for scientific medical practice. Concerted action should be taken through law enforcement, legislation, and education to limit medical practice to persons appropriately prepared and licensed.

High standards in hospitals and other health institutions contribute to high quality of personnel. Both external measures (accreditation of hospitals, approval of internship and residency programs, licensing of proprietary institutions, the federal hospital survey and construction program) and internal measures (medical records, tissue committees, autopsy reports, and medical audits in hospitals) are of first importance in guaranteeing minimum standards for institutions and in assuring a continual rise in the quality of patient care. These measures also have a significant impact on the work of hospital staffs. By setting a base line below which operations may not fall, both external and internal measures of control promote the use of high-quality personnel and the functioning of personnel at maximum levels.

Reinforcement of standards for institutions by specialty board certification and examinations for graduates of foreign medical schools is a further impetus to high-quality personnel. Although the United States should not fill its needs for medical manpower at the expense of other nations, it is a fact that foreign medical graduates constitute a significant segment of our supply of medical manpower.[66] In order to enhance the effectiveness of foreign medical graduates for service in this country and in their own when they return, adequate minimal standards for internship and residency training should be developed, taking into account the varied backgrounds of these physicians.

Responsibility for assuring health personnel of high quality rests on many shoulders. Providers of medical care--both individuals and institutions--are immediately responsible. Fundamentally, the quality of care will be determined by educational institutions, but the professions and their organizations, consumer groups, and government at all levels contribute to and exert pressures for an ever-higher quality of personnel. Much credit is due to the professions themselves, and their organizations, for encouraging postgraduate education in all fields and for such powerful measures as specialty board certification in medicine. As an ultimate source of leadership for assuring quality of personnel and quality of care, Dr. Ray E. Trussell has proposed that responsibility must also be assumed by public health personnel and by hospital administrators. He explained his proposal in this way:

> "If what physicians do for themselves and their families when they are ill is any index of good medical care, the public has a long way to go to catch up. Physicians, when ill, use very well-qualified specialists--salaried as well as nonsalaried. Physicians use large voluntary accredited hospitals. Physicians believe in regionalization of services since many will travel even out of their own state to get to teaching centers for certain kinds of care. In other words, by their own actions practicing physicians endorse for themselves and their families everything for which public health stands. If the practicing profession were organized to do as well for the rest of the nation, there would be little reason for this particular lecture.
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> "The two full-time, trained public health administrators in a prototype community are the public health officer and the hospital administrator. They are, as a general rule, the only people in the community professionally trained to deal with the health problems of all people--which is the responsibility they have accepted, and what they are paid to do. Yet, it is my candid opinion that the rank and file of health officers and hospital administrators--let alone hospital trustees and much of the medical profession--are not doing what needs doing to protect the people to whom they are accountable. And the essence of my thesis is that if public health people do not do the job, it will not be done."[67]

Dr. Trussell spells out a number of ways in which public health and hospital personnel, trained to identify and measure local health problems, can set standards for care within a community and urge improvement of practices in voluntary and proprietary hospitals, nursing homes, laboratories, and health and welfare programs. The measures suggested are designed to raise the quality of performance in the health services. Whether one agrees with this thesis--and not all the members of this Task Force do agree--it is clear from this analysis that the quality of medical care and the quality of health personnel who provide it are inseparable. Effective use of health personnel can shorten the timetable for achieving excellence in both.

COORDINATION OF SERVICES

Fragmentation of health services among numerous voluntary and governmental health agencies, each providing its segment of medical care for those who meet its eligibility standards, is recognized by the Task Force on Organization of Community Health Services as a barrier to a continuum of preventive and therapeutic services. Fragmentation also results in an extravagant use of health manpower. The multiplicity of administrative jurisdictions employing skilled personnel hinders effective use of personnel. Overlapping and duplication of services are a waste of health manpower. The large number of special districts for schools, public health, sanitation, mosquito abatement, water use, and air pollution control entails a profligate use of skilled personnel. Health department nurses, visiting nurses, and school nurses covering the same territory lose valuable professional time in travel. Maintenance of separate laboratories, separate statistical services, and separate technical facilities for different agencies duplicates services and uses personnel inefficiently.

The price paid for fragmentation of health services is seen in the recruitment difficulties of health agencies. Small units of government are competing for limited manpower. Small local health departments are having trouble in attracting and retaining specialized personnel. Governmental agencies and voluntary agencies vie for skilled personnel. Even within government, fragmentation of services, as in the case of school nurses and public health nurses, leads to unbalanced staffing of public health programs.

Coordination of health services would not nullify the virtues that accrue from diverse and specialized health agencies--motivation of health workers and innovation in programs. Each health agency would continue to pursue its goals but in a fashion related to the operation of other community health services. One of the most important benefits of coordinating community health services is the effective use of health manpower. Joint use of skilled personnel can be effected. For example, the coordination of professional nursing services in industrial plants with overall public health programs can provide access to preventive health services for a large segment of the adult population. Increased financial resources from coordination over a large area, as has been done in programs of air pollution control, can command better talent for higher salaries. Coordination of all specialized programs of preventive and curative services will contribute to the use of scarce personnel without fragmentation of service to the recipient of care and with the best economy of time and effort of the health worker.

PLANNING OF SERVICES

Planning health services contributes to conservation of scarce skilled manpower and to effective use of all health manpower. Increasingly, local communities are involved in planning the introduction of new or expanded diagnostic services, in organizing care for the chronically ill and aged, and in determining the need for more hospital and nursing home beds. All agencies concerned with planning for health manpower should recognize the importance to effective use of personnel of adequate, efficient, and properly equipped hospitals and other facilities. Planning of facilities is interdependent with planning for the use of health manpower. On a local and regional basis, all planning should be directed towards making the services of highly skilled personnel available, insofar as possible, where patients live and work.

Factors that local communities should take into account in planning health services are discussed in the report of the Task Force on Health Care Facilities. Among them, the increasing urbanization of American society, improved transportation, and the high cost of specialized services all have implications for the effective use of health manpower. With reference to planning as it affects manpower, the following suggestions may prove useful to local communities:

1. A distinction must be made between those health services that can be planned most appropriately on a regional level and those that must be planned and provided on a local basis. Hospitals, as the Task Force on Health Care Facilities points out, can be planned and coordinated most effectively on a regional level. Hospitalization is a relatively infrequent event as compared with out-of-hospital contacts with a physician. For each 100 people there are about 12 hospital admissions during a single year but about 500 contacts with a physician

outside a hospital. The same distinction must be made in planning environmental health services. Air and water pollution, being no respecters of jurisdictional lines, must be controlled on a regional "problem shed" basis, but sanitation inspections, being frequent events, should be planned on a local basis. The appropriate area for each kind of service will influence the numbers and kinds of personnel needed.

2. Qualified personnel are necessary to give leadership in planning community health services. Many such persons can be found among existing health personnel, of course, but more will be needed as communities increasingly undertake planning of health services. Schools of public health have recognized this need and are developing curricula to prepare personnel equipped for top-level health service administration and community health planning.

3. While improving their planning of health services, local communities should at the same time undertake programs of public education in order to relate the expectations and anticipations of consumers to health resources. By effecting a compatability of expectations, public education will serve to minimize inefficiencies in obtaining service and will prepare the public for acceptance of new kinds of personnel. An informed public will be able to make wise choices in the use of health resources. Realistic appreciation of the problems of providing community health services will contribute not only to effective use of health manpower but to participation of the consumer of service in tackling unmet health needs.

Local planning of health services is of prime importance, but it must be reiterated that effective planning of health services and their staffing cannot be done solely at the local level. Planning must be undertaken on federal, state, and even regional levels, if fragmentation in services and extravagant use of health manpower is to be avoided.

As part of the long-range health manpower program being developed by the Secretary of Health, Education, and Welfare at the request of the President, competent state agencies in all states should be responsible for coordinating planning relating to health manpower. Since excellent planning of health facilities of all kinds--general hospitals, special hospitals, nursing homes, rehabilitation centers, and mental retardation centers--has been done by state departments of public health, it is reasonable to look to health departments also for leadership in planning for the related field of health personnel. Unification of planning for health facilities and personnel would tend to combat fragmentation of responsibility among diverse state agencies. Wherever feasible, therefore, state health departments should undertake to coordinate the many activities of public and private groups related to health manpower. In this function, they should make available to local communities technical consultants on the planning of health services and the use of manpower resources.

RECOMMENDATIONS

The Task Force on Health Manpower recommends, as measures to promote the effective use of health manpower, that:

- Planning for health manpower resources be undertaken jointly by those governmental and voluntary agencies responsible for planning health services and facilities. Government should take the initiative. (Recommendation 1)
- Governmental, private, and voluntary agencies, together with professional associations, encourage and give financial support to innovations in ways of providing health services that will increase the productivity of highly skilled personnel and improve the range and quality of services. (Recommendation 2)
- Government at all levels, by example and financial support, encourage coordinated programs of health service as a means towards effective use of personnel. (Recommendation 3)
- The United States Public Health Service assume responsibility for collecting and reporting health manpower data on a nationwide basis, using standardized classifications, in cooperation with associations representing health occupations, educational institutions, and voluntary agencies. (Recommendation 4)
- Educational institutions, health agencies, and health workers--individually and through their associations--give high priority to increasing the numbers of both existing and new kinds of allied and auxiliary personnel. (Recommendation 5)
- The health team function with each member contributing his most highly developed skills. Innovation and experimentation be undertaken to expand and develop the roles of allied and auxiliary personnel. (Recommendation 6)
- Governmental and voluntary community health agencies and institutions recruit qualified administrators, not necessarily physicians, for planning and administering programs of health service. (Recommendation 7)
- Educational institutions, voluntary and governmental agencies, and professional and occupational groups make every effort to improve education and performance for each class of health personnel in order to increase productivity and to raise the quality of health services. (Recommendation 8)

- National minimum requirements for licensure of personnel in all the health professions and occupations be established, with freedom for the states to set higher standards to meet their individual needs. (Recommendation 9)
- Health agencies and professional organizations, in cooperation with educational institutions at all levels, develop programs of public education to help potential consumers of health service participate intelligently in their health care. (Recommendation 10)

NOTES

(*See Bibliography for detailed annotation)

1. Figures computed from data in Tables 13, 26 and 36, "Manpower in the 1960's."*
2. "Medical Care, Health Status, and Family Income," p. 3.*
3. 'Current Statistical and Activities Report,' "Mental Health Manpower," p. 1 and Table 1.*
4. "Health Statistics From the U.S. National Health Survey; Loss of Teeth, United States, July 1957-June 1958," p. 2.*
5. Wesley O. Young, 'Dental Health,' "The Survey of Dentistry," p. 1.*
6. See "The Early Detection and Prevention of Disease,"*
7. Milton I. Roemer, M.D., 'Health: Can We Afford to Meet the Needs?' "The Social Service Review," 38:3, September 1964, p. 263 at 266.
8. Seymour E. Harris, "The Economics of American Medicine," p. 109.*
9. See Paul V. Joliet, M.D., 'Accident Prevention and Poison Control' in "Administration of Community Health Services," p. 186.*
10. David B. Ast, D.D.S., and Bernadette Fitzgerald, 'Effectiveness of Water Fluoridation,' "The Journal of the American Dental Association," 65:5, November 1962.
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13. Herbert R. Edwards, M.D., 'Tuberculosis,' "Administration of Community Health Services."*
14. "Manpower in the 1960's," pp. 16, 17.*
15. For an historical and sociological analysis of allied health personnel, see Eliot Freidson, 'Paramedical Personnel,' "International Encyclopedia of the Social Sciences," 1964.
16. See Leon Eisenberg, 'An Evaluation of Psychiatric Consultation Service for a Public Agency,' "American Journal of Public Health," Vol. 48, June 1958, p. 742 for the suggestion that scarce child psychiatrists be reserved for diagnosis and planning of therapy with the execution of therapy and clinical management of cases assigned to others.
17. John L. Caughey, 'Auxiliary Personnel in Medical Practice,' "American Journal of Public Health," Vol. 48, August 1958, p. 1049 at pp. 1050, 1051, 1052.

18. See Darrel J. Mase, Ph.D., 'Manpower Utilization for the Future,' "Journal of Rehabilitation," January-February 1964.

19. "Toward Quality in Nursing, Needs and Goals," p. 9.*

20. Ibid., p. 22.*

21. Table 8, Chapter II.

22. Wesley O. Young, 'Dental Health,' "The Survey of Dentistry," p. 83.*

23. Ibid., pp. 150-151, Table 30.*

24. 'The 1962 Survey of Dental Practice, Summary,' "Journal of the American Dental Association," 68:1, January 1964, p. 132 at 133.*

25. B. Duane Moen, "Survey of Present and Future Needs for Dental Manpower."*

26. Melvin L. Dollar, 'Estimates of the Effects of Fluoridation, Improved Equipment and Additional Auxiliary Personnel on Dental Manpower Requirements,' "The Survey of Dentistry," Appendix A at p. 482.*

27. "The Survey of Dentistry," pp. 237-238.*

28. Jay W. Friedman, D.D.S., M.P.H., 'Dental Care Programs: Prospects and Perspectives,' "Journal of Health and Social Behavior."* (Winter 1966)

29. "The Survey of Dentistry," p. 88.*

30. "Education for the Health Professions," p. 25.*

31. For a proposal for a national commission to make recommendations on education, recruitment, and use of allied health workers, see Edwin L. Crosby, M.D., "Health Manpower in the United States, A Review and Reappraisal," p. 12.* Also, the Final Report of the American Medical Association's Committee to Study the Relationships of Medicine and Allied Health Professionals Services led to the establishment of a commission to coordinate the relationships of medicine with allied health professions and services.

32. Howard Jacobson and Duncan Reid, 'High-Risk Pregnancy. A Pattern of Comprehensive Maternal and Child Care,' "New England Journal of Medicine," August 6, 1964, p. 302; Louis M. Hellman and Francis B. O'Brien, Jr., 'Nurse-Midwifery--An Experiment in Maternity Care,' "Obstetrics and Gynecology," September 1964, p. 343.

33. Harry Nelson, 'Big Role Seen for Supernurse,' "Los Angeles Times," November 22, 1965.*

34. The need for innovation in the use of manpower is, of course, not limited to allied and auxiliary personnel. Current discussion of the need for a family health adviser to help patients thread their way through the complexities of modern preventive, diagnostic, curative, and rehabilitative medicine (whether the adviser be a general practitioner, an internist, a public health nurse, or a social worker) suggests that reexamination of functions of all health personnel is in order. See discussion of this problem in the Report of the Task Force on Comprehensive Personal Health Services.

35. For a discussion on this subject see "Health Administration and Organization in the Decade Ahead," Report of the Task Force on Organization of Community Health Services.

36. See Report of the Task Force on Health Care Facilities for a concept of the health campus.

37. 'Where Physicians Work,' "Progress in Health Services," 13:3, May-June 1964.*

38. See "Group Practice: Guidelines to Forming or Joining a Medical Group."*

39. S. David Pomrinse, M.D. and Marcus S. Goldstein, Ph.D., 'The 1959 Survey of Group Practice,' "American Journal of Public Health," 5:5, May 1961, p. 674, Table 3.

40. Ruth Raup and Marion E. Altenderfer, "Medical Groups in the United States," pp. 54-58 and "New Medical Materia," 5:3, March 1963. Note re the report cited in "New Medical Materia": In personal correspondence to the technical staff of the Task Force, the secretary to the editor of "New Medical Materia" indicated that three separate surveys were the basis for the report--(1) a random nationwide sampling of 5,000 physicians; (2) a nationwide cross-section of 500 physicians engaged in group practice; and (3) a survey of the business managers of 1,400 group clinics. Questionnaires were mailed to every state. Responses ranged from 30% for the clinic managers to 55% for the doctors in group practice.

41. 'Where Physicians Work,' "Progress in Health Services," 13:3, May-June 1964; and Ruth Raup and Marion E. Altenderfer, "Medical Groups in the United States, 1959," pp. 54-58.*

42. "New Medical Materia," 5:3, March 1963, p. 17. For basis of this report, see footnote 40 above.

43. Herman Miles Somers and Anne Ramsay Somers, "Doctors, Patients, and Health Insurance," p. 506.*

44. See "United States Statistics on Medical Economics," p. 17.*

45. E. Richard Weinerman, M.D., 'Yale Studies in Ambulatory Medical Care, IV. Outpatient Clinic Services in the Teaching Hospital,' "New England Journal of Medicine," 272 (May 6, 1965), p. 948.

46. Milton I. Roemer, M.D., 'Hospitals, Health Centers, and Group Practice,' "The Modern Hospital," April 1950.

47. "The Comprehensive Community Mental Health Center," p. 8.*

48. *Ibid.*, pp. 12, 13.*

49. David Littauer, M.D., I. Jerome Flance, M.D., and Albert F. Wessen, Ph.D., "Home Care," p. 5.*

50. A project on "The Locus and Focus of Homemaker-Housekeeper Services for the Chronically Ill and Aged," sponsored by the Health and Welfare Council of Metropolitan St. Louis should prove helpful in pointing new directions for the use of such personnel in the care of the chronically ill and aged.

51. David Littauer, M.D., I. Jerome Flance, M.D., and Albert F. Wessen, Ph.D., "Home Care," p. 95.*

52. See Chapter II, Figure 4.

53. "Manpower in the 1960's," p. 56.*

54. "Resources for Medical Research," p. 16.*

55. "The Survey of Dentistry," p. 86.*

56. Report of the Committee on Environmental Health Problems to the Surgeon General, U.S. Department of Health, Education, and Welfare, Public Health Service, 1962, pp. 15-16. *Cf.* increased need for environmental health scientists, text at footnote 21, Chapter V.

57. Milton I. Roemer, M.D., 'The Nonmedical Health Administrator: His Training and Value,' "California's Health," 21:15, p. 113.* (February 1, 1964).

58. Milton I. Roemer, M.D., 'Medical Care Administration in the United States: Personnel Needs and Goals,' "American Journal of Public Health," 52:1, January 1962, p. 12.

59. Milton I. Roemer, M.D., "Medical Care Administration: Content, Positions, and Training in the United States," p. 137.*

60. Milton I. Roemer, M.D., 'The Nonmedical Health Administrator: His Training and Value,' "California's Health," 21:15, p. 114.* (February 1, 1964).

61. John W. Gardner, 'The Need for Leaders,' "Science," 151:3708, January 21, 1966, p. 283.

62. Statement of Dr. Walter S. Wiggins, Secretary of the AMA's Council on Medical Education and Hospitals, "AMA News," February 23, 1959, cited in Herman Miles Somers and Anne Ramsay Somers, "Doctors, Patients, and Health Insurance," p. 114.*

63. See Esther Lucile Brown, Ph.D., "Newer Dimensions of Patient Care," p. 87.*

64. 'Requirements for Admission to Schools of Chiropractic,' "Journal of the American Medical Association," Vol. 190, November 23, 1964, pp. 763-764; also see Kathleen Cassidy Doyle, "Science vs. Chiropractic."*

65. Proceedings of the National Congress on Medical Quackery, sponsored by the American Medical Association and the Food and Drug Administration, American Medical Association, Chicago, Illinois: October 6-7, 1961.

66. See "A National Program to Conquer Heart Disease, Cancer and Stroke," Vol. II, p. 281.*

67. Ray E. Trussell, M.D., 'The Quality of Medical Care as a Challenge to Public Health,' "American Journal of Public Health," 55:2, p. 173 at 174.* (February 1965).

CHAPTER IV

Recruitment

Broadly construed, recruitment is coextensive with the total problem of health manpower: the provision of sufficient numbers of adequately trained personnel for the health professions and occupations to provide modern community health services in the decade ahead. Here the concern is with recruitment in a more limited sense--the attraction of personnel from various sources of manpower to the field of health services generally and to specific health professions and occupations. Included are both traditional job classifications and new, emerging positions demanded by modern programs of health service. Brief mention is made of methods of recruitment to specific jobs and programs, but comprehensive analysis of the problems involved in matching personnel and jobs through sound and resourceful placement procedures must be left to others.

RETENTION TO HIGHER LEVELS OF EDUCATION

Recruitment for the health professions and occupations takes place among graduates of high schools and colleges. The population age groups from which future health personnel will be drawn are expanding. Increasing numbers of these young people are going on to college; between 1960 and 1975 the number who graduate each year from college may double.[1] The average level of education is rising for both men and women at all ages.[2] In 1962, 32 percent of the civilian labor force 18 years of age and over had completed high school, and 11 percent had completed four years of college or more, as compared with 27 percent who had completed high school in 1952 and 8 percent who had completed four years of college or more.[3]

Margaret D. West presents the outlook thus: "Today, young people have a higher average level of education than their fathers. In fact, it has been pointed out that our present national concern about high school dropouts represents not a decline in the proportion who finish high school, but rather an increased appreciation of the value of a high school education. Looking ahead to 1970, we can see... a ... labor force ... with a substantially higher proportion of high school and college educations...."[4]

Nevertheless, many more young people are capable of higher education than achieve it. The percentages of men and women who do not graduate from college and the lower college admission rate for women than for men give disquieting evidence that the nation's potential manpower is not being developed. In 1962, 601,000 men, or about 52 percent of the males of the college-entrance age group, were admitted to college; but only 225,000, or about 24 percent of the college-entrance age group, were graduated. Of the women in this age group, only 38 percent entered, and only 13.5 percent were graduated. Thus, fewer women than men enter college, and of those who enroll about 50 percent are graduated. Of men who enroll, about 60 percent are graduated.[5] No genetic shortage of young people intellectually capable of achieving higher education blocks an adequate supply of trained manpower. A study of the high school ability of a sample of the doctorate population shows that the number of persons achieving a doctorate in all fields could be multiplied 40-fold and still not exhaust the potential candidates with adequate native talents.[6] As the National Manpower Council has said: "Less than half of the youth of the country capable of acquiring a college degree do not enter college, and two-fifths of those who do enter college do not graduate. Almost one-fifth of the top ten percent of the young people in the country, measured in terms of I. Q., are not now graduating from college. For every youngster who graduates from high school with ability to earn a Ph. D. degree, there are another 25 who do not. Only one out of every 300 women with the intellectual ability to earn a doctoral degree actually does so. These figures testify to a loss of "brainpower" which the nation can ill afford."[7]

The goal must therefore be not only increased enrollment but increased retention to higher levels of education.

High Schools

At the high school level, recruitment to the health field can be served best by encouraging expanded enrollment in higher education. Since motivation towards a career is one of the most important factors affecting a high school student's decision to seek further education, counselling on vocational, technical, and professional opportunities for work in health services contributes to further education. For students not undertaking a four-year college education, information about opportunities in the health field and effective guidance and counselling at the high school level may be decisive in directing students to two-year colleges and other programs for training in the health occupations.

Support by the federal government of vocational education for persons of all ages--both high school graduates and dropouts--has provided an increased source of auxiliary health personnel. The Vocational Education Act and the Manpower Development and Training Act have increased the recruitment and training of practical nurses, dental assistants, medical assistants, laboratory technicians, x-ray technicians, occupational therapy assistants, physical therapy aides, and opticians' aides.[8] Extension of federal support for vocational and technical education to other groups in the health field is envisaged--to hospital food service supervisors, psychiatric aides, and social casework aides. Programs of adult education and night classes in high schools may also provide training for auxiliary health personnel.

Two-Year Colleges

The growth of two-year colleges in recent years, both in increased enrollment and in expanded curricula, heralds a source of personnel for the health occupations of a new order of magnitude. With the expansion in college-age population, new two-year colleges are being developed and existing ones enlarged to admit students to schools close to their homes for both terminal courses and courses preliminary to transfer to four-year colleges.[9] The goal already realized in a few states and in sight for the country as a whole is expressed in the recommendation of the Subcommittee on Employment and Manpower of the Senate Committee on Public Welfare: that free public education be extended to include vocational and technical schools, junior colleges, and the first two years of college, so that up to 14 years of free public education are universally available.[10]

Terminal courses offered by two-year colleges for dental and laboratory technicians, dietitians, medical secretaries, nurses, social case work aides, and other health occupations can, with proper development, add a new dimension to the recruitment of personnel. In planning terminal health programs in two-year colleges, the possibility of the student's transferring to a four-year college should always remain open, but students with the requisite ability should be encouraged to undertake four-year college programs from the start. Courses designed to lead to transfer to other colleges in dentistry, dietetics, medicine, nursing, pharmacy, and veterinary medicine can also reach out to students who might otherwise have been lost to the health field or to higher education generally. Effective development of the potential of two-year colleges for the preparation of health personnel requires studies by educational institutions and occupational groups to determine the categories of health personnel who should be prepared in two-year colleges and those who should

Two-year colleges should assign high priority to the development of curricula in health subjects. Existing courses should be expanded to accommodate increased enrollments, and additional courses should be offered. These colleges should enlist the aid of health agencies and occupational groups in determining curricular needs and content. One caveat is necessary: these programs should be developed only in schools that meet the criteria designed to safeguard the quality of education in two-year colleges.[11] In the large effort that will be needed to expand and develop health curricula in two-year colleges, state health departments or other agencies responsible for manpower planning can play a decisive part in mobilizing educational institutions, professional and occupational groups, and health agencies to prepare sufficient numbers of skilled allied and auxiliary health personnel to meet the needs for existing and new programs of health service.

Colleges and Universities

Professional schools are highly dependent on the colleges and universities which provide the basic education requisite to training in one of the health professions. College enrollments rose 1.7 million from 1940 to 1960, and by 1975 it is predicted that 6.5 million will be enrolled--an increase of 3.3 million in 15 years.[12] The number of bachelor's degrees awarded in 1970 will probably be 80 percent greater than in 1962.[13] Master's degrees were awarded to about 85,000 students in 1960, to about 100,000 in 1965, and it is predicted that this figure will rise to 150,000 in 1970.[14] Doctoral degrees were awarded to 11,622 in 1962, to about 13,300 in 1965, and it is predicted that this figure will exceed 18,000 by 1970.[15]

Despite the increasing numbers of persons with higher education, many specialized fields of health service and their career possibilities are not known to students or their parents. All students, of course, know the traditional professions--medicine, dentistry, and nursing, but how many are familiar with the possibilities for creative work in biostatistics, medical care administration, or environmental health service? Many students who find their way into these or other specialties in health service do so by chance or as a result of some fortuitous contact with a professor or health service specialist.

The primary task of recruitment in colleges and universities is to inform students of the many and varied health careers and the opportunities they present for intellectually rewarding work and for community service. Almost all colleges require students to take courses in the physical or biological sciences and in the social sciences. Faculty members in these fields are thus in a position to alert large numbers of students to career opportunities in health service. Greater effort must be directed towards providing these faculty members with information about careers in health.

More individualized counselling of students on professional and graduate education for the health services would yield dividends in recruitment. The breadth of the health field and the many kinds of work contained within it provide appeal for students of different interests. Effective counselling by colleges and universities would reach not only the many undergraduates whose career aspirations are amorphous during their college years but also persons who have prepared for work in other fields and wish to change. In this latter group are those who may have been exposed during their military service to a wide variety of health activities or who through other means have been inspired by emerging health careers, e. g., mental health counsellor, health service or hospital administrator, etc. Fellowships are an inducement to undertake graduate training, but students must also be informed of the opportunities and motivated to seek them. In general, new and imaginative ways must be found to open to college students the vista of work in the field of health services.

Professional and Graduate Schools

Total enrollment in graduate study is increasing. In selected science fields, graduate enrollment has shown a sharp rise.[16] By contrast with this gain, the rate of increase in medical school enrollment has been relatively slow because of the limited number of places in medical schools. Moreover, training for medical students (including the years of internship and residency) is nearly twice as long as for Ph. D. candidates, and until 1965 there were four times fewer scholarships available to assist medical students during this long period than for Ph. D. candidates.

The financing of professional and graduate education is not, of course, the sole determinant of the student's decision to continue his studies or to choose a particular field, but its importance cannot be denied. A study by the National Opinion Research Center of career aspirations of students concluded that "external obstacles," rather than motivation, were the determinant of graduate study for most students.[17] Of these obstacles, financial problems were found to be the most important.

At the beginning of professional or graduate training, students have usually decided on their field of work. To some extent, however, there is fluidity as to sub-specialty. In influencing graduate students and professional students to turn to one or another specialty, a number of measures may be effective: individualized guidance with matching of talents and interests to special fields; greater interdisciplinary exchange and exposure to specialized fields, as, for example, in the many-faceted field of environmental health or in medical specialties; and opportunities for meeting established career workers with high morale, enthusiasm, and job satisfaction in various specialties.

SPECIAL POPULATION GROUPS

Certain groups within the population constitute a reservoir of potential health manpower that has not been fully tapped. These include: young people with limited financial resources, members of minority groups, women, military personnel returning to civilian life, inactive health personnel, volunteers, technologically displaced workers, physically handicapped workers, and retired and older workers. In the past, discrimination has barred recruitment from some of these groups, but much progress has been made in removing discriminatory barriers. Vestiges of discrimination, however, limit the health field to competition for personnel to whom the educational channels are already fully open. Elimination of these barriers is, of course, a matter of simple justice. Affirmative efforts to remove all discriminatory barriers and to recruit personnel from neglected groups will yield the reward of increasing the universe from which manpower can be drawn.

Students of Limited Means

Every study of methods to assure an adequate supply of health manpower has stressed the necessity of providing scholarships, fellowships, living stipends, and loans. In many specialties, the availability of scholarships has directly increased the number of students enrolled. Federal aid has contributed to the marked rise in graduate enrollment. Graduate enrollment in selected science fields at the 100 leading institutions that enroll more than 90 percent of the students increased 39 percent in the five years from 1959-60 to 1963-64. The National Institutes of Health provided support for a large segment of these graduate students, e.g., for 37 percent of the students in the basic medical sciences.[18] Recruitment of students for graduate work in public health and medical care has been facilitated by traineeships available from the United States Public Health Service. Scholarships from voluntary organizations and foundations, such as the health scholarships of the National Foundation for five health careers, have also provided significant inducement to enter fields of special need.

Under legislation enacted in 1965--the Health Professions Educational Assistance Amendments--scholarships funded by the federal government are available for the first time for students from low-income families in schools of medicine, osteopathy, dentistry, optometry, podiatry, and pharmacy. Formerly, only federally guaranteed loans under the National Defense Education Act, loans from private organizations, such as the American Medical Association, and a small amount of private scholarship aid were available. This new federal scholarship aid is designed to open the possibility of studying medicine to qualified students now barred by its cost.

The 1963-64 Survey of Medical Student Financing conducted jointly by the United States Public Health Service and the American Association of Medical Colleges revealed the average cost for four years of medical education for a single student to be $10,850 and for a married student with no children, $19,190.[19] Relatively few scholarships were available to help the medical student defray these substantial costs. For the 1962-63 school year, 81 percent of life science graduate students received median stipends of $2,700, compared with only 17 percent of medical students with an average stipend of $585.[20] Graduate students in the life sciences thus enjoyed a 16 to 1 advantage in stipends over medical students.[21]

Accordingly, it is not surprising to find that medical students today tend to come from upper income families. In 1959, the American Association of Medical Colleges found in a study of student finances that 45 percent of the 1959 medical school graduates were drawn from the 11 percent of families in the $10,000 plus income bracket.[22]

The cost of medical education has clearly acted as a formidable deterrent to qualified applicants from lower income families. The new federal scholarship aid will help to rectify this injustice and increase the universe from which qualified students will be drawn. But even substantial scholarship aid cannot increase total enrollments unless the capacity of medical schools is expanded. In 1963-64, there were 1.95 applicants for every acceptance in United States medical schools; expressed another way, only 51 percent of the 1963-64 applicants were offered a place in medical schools.[23] The primary task, therefore, is to build new medical schools and to expand the capacity of existing schools--a task for which the new legislation also wisely provides financial support.

The high cost of dental education and the paucity of scholarships tend to limit the dental profession also to students from high income families. The average cost of a four-year dental education in 1959-60 was $13,260.[24] The Commission on the Survey of Dentistry found that only 2 percent of dental students have scholarships and that "the overwhelming majority of applicants are in a favorable (financial) position to undertake four years of study of dentistry, one of the most expensive types of higher education" (parentheses added).[25] The new legislation will, in the words of that Commission's recommendation for scholarships and loans, enable more young people to consider dentistry as a lifetime career even though their parents cannot offer them the financial assistance needed for a dental education.[26]

In nursing education, where the costs are lower ($515 for the two years of the associate degree program, $590 for the three years of the diploma program, and $3,250 for the four years of the baccalaureate degree program), the Surgeon General's Consultant Group on Nursing recommended that federal funds be made available for low-cost loans to students in associate degree, diploma, and practical nursing schools and for scholarships to students in baccalaureate and higher degree programs.[27] In 1964, Congress enacted the Nurse Training Act, providing for low-interest loans to nursing students. Scholarships are also available for nursing students at the master's level, and traineeships for public health nursing. No federal aid exists, however, for nursing students at the baccalaureate level.

Not only has federal scholarship aid thus been made available to students in various health professions for the first time, but federal aid to college students has been greatly expanded. Under the Higher Education Act of 1965, scholarships for needy students and expansion of work-study grants and low-interest loans to middle-income students will enable increased numbers of students to finance their basic education. To the extent that the economic barrier to education is removed, increased numbers of candidates for health careers will be prepared.

Important first steps have now been taken to correct the inequality in educational opportunity that had in large part restricted recruitment for the health professions to those able to pay for their education. Adequate and continuing scholarship aid will be essential if more physicians, more dentists, more nurses, and more health workers of all kinds are to be recruited from the untapped reservoir of "the bright sons and daughters of less affluent families."[28]

Students from Minority Groups

At this stage in the history of the United States there is no need to belabor the injustice or even the price we pay for "the ugly fact of discrimination."[29] To the extent that Negroes and other minority groups are still excluded from the health field, whether by reason of inferior, segregated education at the lower levels or lack of educational opportunity resulting from economic or racial barriers at the higher levels, our society in general and our health services in particular are the losers. Only about 12 percent of workers in health services are nonwhites, and these are mostly in the lower level positions.[30] The United States has only about 4,500 Negro doctors and 2,000 Negro dentists, out of an estimated Negro population of 20 million.[31]

Although the number of Negro students attending medical schools has more than doubled over the past 26 years, their total number in 1961-62 was only 803.[32] Today Negro medical students are enrolled in 57 schools, or 67 percent of the 85 medical schools, and other schools have announced that they will accept qualified Negro students.[33] In recent years, medical schools have considered Negro applicants on their merits after a brief interval in which special consideration was given to the Negro applicant possessing borderline qualifications, with a resulting high attrition rate. The sharp increase in the total number of applicants from all racial groups, which began in 1962, and the resulting higher level of entering students make it unlikely that the number of Negroes entering medical school can increase appreciably unless financial and educational assistance is given to the promising Negro student in high school and college.

The effort to increase recruitment of Negro students into the health professions--medicine, dentistry, and engineering--depends on the improvement of the educational system from the earliest years of schooling. Considerable progress has been made in recent years in this direction, but gross inequities persist. In 1962, almost twice as many nonwhites were high school graduates as ten years earlier; but only one-third of the nonwhite labor force had finished high school or attended college as compared with one-half of the white labor force that had received this amount of education.[34] Only 3 percent of Negro men are in professional occupations. An important task is to improve the basic educational preparation of minority students. Programs to provide tutoring and counselling to promising students are helpful,[35] but to reach large numbers of students stress must be placed on improvement of the total school system.

Without relaxing efforts towards the goal of preparing increased numbers of minority students for the health professions, in the immediate future emphasis should be placed on recruitment for health positions requiring less preparation than medicine and dentistry. Priority should be given to recruiting nurses, sanitarians, dental hygienists, laboratory and x-ray technicians, and other allied and auxiliary personnel from minority groups. Ways of publicizing opportunities for preparation and work in health services are discussed below, and these techniques should be directed towards bringing students from minority groups into the health field. Lessons might be learned from the field of nursing and its experience over the past ten years with an aggressive program to recruit Negro nurses. A positive, forceful orientation to remove racial and religious barriers should take the form of motivating students from minority groups towards health service and of economic aid to facilitate their education.

Women

The majority of health workers are women,[36] but these women, like women workers generally, tend to be employed at levels lower than for men. In 1960 only 7 percent (15,513) of physicians were women, and 1 percent (1,949) of dentists were women.[37] The overwhelming majority of nurses are, of course, women. Women also constitute 85 percent of the medical technologists,[38] as well as the vast majority of social workers, occupational therapists, laboratory workers, dental hygienists and assistants, and clerical employees.

Current forecasts indicate that an increasing percentage of the total labor force will be women. By 1970, a 31 percent increase in the number of women in the labor force is projected, as compared with a 17 percent increase for men.[39] In 1963, more than half the women in the 45 to 54-year age bracket were in paid employment.[40] It has been estimated that the number of women past 45 in the labor force will increase by 30 percent in the next decade.[41] With lengthening life spans and the growing tendency of the mature woman to return to the labor market, women constitute a significant potential for health personnel beyond the 1,800,000 now employed in health services.

The predominance of women in the less skilled positions in health service is associated with limited education. Although the percentage of women in the civilian labor force who have completed high school rose from 51 percent in 1952 to 62 percent in 1962, and the percentage of women college graduates from 8 percent to 10 percent during the same period,[42] the ratio of M. A.'s to B. A.'s has not risen during the postwar years, and the same is true for Ph. D.'s.[43]

In many countries of South America and Europe, women constitute a large percentage of the physicians, but in the United States the long and expensive preparation, the years of postgraduate work, and the individual effort and ingenuity required to combine the responsibilities of the home with the practice of medicine have kept the number of women in medicine low. The percentage of women accepted by U.S. medical schools as compared to all acceptances has increased from 4.5 percent in 1929-30 to 9.1 percent in 1964-65. During the nine years preceding 1961-62, women earned 35 percent of all bachelor's degrees; however, the percentage receiving degrees from United States medical schools was only 7.3 percent of the total number of M.D. degrees awarded in 1965.[44] By comparison, the percentage of all women medical graduates in Canada is 12 percent and in Great Britain 24 percent.

In the United States, unlike other countries,[45] dentistry has traditionally been a male occupation although this profession might well lend itself to combination with the duties of home and family. Some dental schools want women students, but few apply. Here is a career for women that should be publicized through well-designed literature and counselling at the high school and college levels.

The President's Commission on the Status of Women recommended a number of measures to increase educational opportunities for women. Higher education should be available in a form adapted to the needs of women with family responsibilities. Part-time study should be facilitated. Colleges and universities should provide for flexibility in admission policies, academic prerequisites, residence requirements, and scheduling of courses. Continuing and vocational education should be available in two-year colleges in local communities. More imaginative counselling should be provided.

The Task Force endorses these recommendations as particularly pertinent to the education and recruitment of women for the health services. Above all, the importance of a scientific education for women should be recognized if women are to make their full contribution to the health services. Since women now constitute more than half of existing health personnel, a logical next step to maximize the contribution of these women and to attract additional numbers is to enlarge the educational opportunity for women and to enrich the content of their education.

Existing Health Personnel

Among special population groups that have not been fully tapped, existing health personnel who could be upgraded should not be overlooked. Here are persons already motivated towards work in the field of health services, who, with increased preparation, could make an increased contribution. Every encouragement and opportunity should be given to the medical secretary who wants to become a health administrator; to the sanitarian who wants to study engineering; to the practical nurse who wants to become a registered nurse; to the dental assistant who wants to become a dental hygienist; to the person in any branch of health service who has the interest and capacity for work in a more highly skilled specialty. The Manpower Development and Training Act and the National Vocational Education Act provide financial aid for upgrading the skills of those who are working below their occupational potential and particularly for technical and vocational education.[46] Extension of this policy to higher levels of training and education requires that existing health personnel take advantage of two-year colleges close to their homes, of state universities, and of federal support for graduate training in many health fields.

Military personnel who have had training and experience in health work during their military service might well be recruited to health careers on their return to civilian life. A concerted effort should be made to channel such military personnel into various health programs and positions and to supplement their training and experience with further education, where necessary.

Reactivation of persons absent from the health field provides another source of personnel. The largest group of inactive health personnel consists of nurses. It is estimated that a half million women trained as registered nurses are not now practicing. The Surgeon General's Consultant Group on Nursing lists several possible incentives to attract nurses back to practice: refresher courses; placement of nurses in positions close to their homes; convenient working hours and part-time work; and higher pay.[47] Such measures have proved successful in recruiting inactive nurses in several states.[48]

Still another group that can provide a source of health personnel consists of volunteers working in hospitals, health agencies, and community organizations. The contribution of this valuable segment of health manpower could be increased by upgrading the tasks they perform and assigning them enlarged responsibilities. Many of these persons, now serving as board members of voluntary organizations or as health aides of various kinds, would make dedicated full-time health workers, if the opportunity for education and training were offered.

Recruitment of existing health personnel to more highly skilled technical and administrative positions may take place through job enlargement, but more often the mechanism will be continuing education, short-term training, or graduate education. Persons in professional and supervisory positions who are alert to the potentialities of health service personnel can be decisive in increasing the skills of persons with experience in health services who are already pledged to the field.

OTHER SOURCES OF PERSONNEL

Many other groups are logical sources of personnel for the health field: technologically displaced workers, who can be retrained for health service; physically handicapped workers, whose personal health experiences may adapt them to be valuable members of a health team and whose service may promote their own rehabilitation; retired and older workers whose skills and maturity can be used on a part-time or full-time basis.

The field of health services should look to still other sources of personnel. Since fewer than half the applicants to medical schools can be accepted because of the limited number of first-year places in medical schools, applicants not accepted should be encouraged to prepare for work in other health fields. These students have expressed an interest in health service and usually have preparation in the biological sciences. The health field should not lose them.

Moreover, many fields of health service at present identified predominantly as female might be able to recruit men. Trends in employment in elementary education, library science, and social work--all traditionally women's occupations thirty years ago--give promise that men could be attracted in significant numbers to nursing, dental hygiene, physical therapy, occupational therapy, and other health occupations now generally considered women's occupations. In order to recruit men to the many positions in these fields that they could fill satisfactorily, job opportunities must be opened to men in these fields and salaries must be raised. New titles, redistribution of tasks, and new roles should be developed to change the public image of these occupations as exclusively women's work.

TECHNIQUES OF RECRUITMENT

Techniques of recruitment comprise the many measures that can be taken to attract personnel from various sources to the field of health service generally and to specific health professions and occupations. The National Health Council has pioneered in developing, communicating, and coordinating techniques for recruitment to health careers. Its publications are rich in ideas that can be adapted to the many fields of health service and the various areas of the country.[49]

Techniques now used in recruitment to health careers include brochures on specific health careers, films, special publications listing jobs and openings in health service, and use of mass media for presenting opportunities in health service to students and their parents. The health story is dramatic, and books, magazine articles, and television programs should continue to tell it.

In addition to verbal communications, other techniques are effective: extracurricular programs in health service conducted by the Red Cross, the Scouts, the Y's, and other youth groups; guided tours of health facilities and agencies for high school students; health careers clinics sponsored by health agencies and professional groups; and Future Physicians' Clubs and Future Nurses' Clubs. Summer work-study programs are a particularly valuable means of interesting students in health careers. These programs should be extended and improved. Governmental and private financial aid should be made available to state and local health agencies and institutions to provide grants to students at all educational levels for work and study and to subsidize supervision for work-study programs. All these measures bring work in health service into public view. They reach individuals concerned with choice of a career and provide accurate and up-to-date information on current opportunities for training and work in the health services.

Immediate attention should be directed to the amount and quality of guidance and counselling for health careers in schools and colleges. Since choice of an occupation stretches over a long period, from age 11 to 19 or beyond, occupational guidance should go hand-in-hand with educational guidance.[50] Nevertheless, it has been found that "close to half of the states receiving federal funds for their (vocational and technical) programs spend less than one percent of that money on occupational guidance and counselling." Guidance counsellors in high schools may have only scanty or, at most, general knowledge of the possibilities of the various health specialties and the preparation required despite the volume of literature which is addressed to them. Assignment of responsibility for health careers recruitment in high schools to science teachers or school nurses, who are equipped to interpret the health field, would supplement the work of guidance counsellors.[51] Faculty and staff could together stimulate and coordinate organized recruitment efforts and also encourage informal recruitment in science classes and health courses, including the formation of "Health Science Career Clubs."

In view of the growing importance of the two-year college, particular emphasis should be placed on improved occupational guidance at this level. The development in the two-year college of a core curriculum for all the health services[52] should be tied to improved occupational counselling at this crucial stage of a student's career. Both these measures will make the possibilities of work in the health field more visible to students entering two-year colleges.

Responsibility for carrying out recruitment to health careers is shared by many agencies--agencies of the federal, state, and local governments; schools and colleges; voluntary agencies; professional associations; and health professionals themselves. Organizations, both governmental and voluntary, are carrying on extensive recruitment activities. These should be continued and expanded. Many measures would be fruitful, including the assignment by national organizations of personnel to recruiting and the establishment of counselling institutes, such as those held under the auspices of the National Defense Education Act. Increased effort directed toward students in neglected population groups and in small schools and colleges, outside of urban centers, would reach students not now informed of the many new opportunities for education and work in health service.

The greatest impact on recruitment can probably come from increased effort by health professionals themselves. In the field of dentistry, a survey of 1,098 students applying for admission to enter dental school in 1959 revealed that of the outside influences directing these students to dentistry the family dentist was the most important; 48 percent attributed their decision in part to the influence of the family dentist, 36 percent to the father, 25 percent to the mother, 8 percent to a college advisor, and only 5 percent to a high school vocational counsellor.[53] Young professionals are in a particularly advantageous position to aid the development of such groups as Future Physicians' Clubs and Future Nurses' Clubs, because young people can easily identify with them. Students in medical schools and in graduate programs could also be used effectively in a community plan of recruitment for health careers. The Associate Director of the Western Interstate Commission for Higher Education, in recommending a model communications program on health careers from junior high school through graduate school, had this to say:

> "A primary feature of such a model should be direct and continuing contacts between prospective students and practitioners in the health careers. For too long we have been satisfied with having our recruiting done by intermediaries. It's time for the doctors and the nurses and the medical technicians and the dentists to become involved directly in the recruiting process--to meet talented young people, to talk with them realistically about their professions, to take them into their offices, their laboratories and on to the wards so that they may have firsthand information concerning the professions they are considering. The health careers are full of excitement and challenge, and we need to communicate this to students in the most effective possible way--by direct contact with the professions."[54]

The recruitment activities now in progress can yield their proper return only if recruitment is approached in a coordinated way on a statewide basis. Some states have already initiated health careers recruitment programs.[55] As part of the long-range health manpower program being developed by the Secretary of Health, Education, and Welfare at the request of the President, state health departments, or other agencies responsible for manpower planning, should undertake to coordinate the recruitment activities of governmental agencies and voluntary groups. Without directly being engaged in training personnel themselves, state health deparments are in an ideal position to make studies to determine exact needs for health personnel and resources available for their training and to encourage necessary steps to match training programs with needs. To carry out this responsibility, state health departments should work with community health agencies, including voluntary planning agencies and state health careers councils; with the health professions and occupations; with educational institutions; and with state licensure authorities.

Recruitment of already qualified individuals to specific jobs and programs is also important. How, for example, does a local health department recruit public health nurses? A community mental health program recruit psychological counsellors? An environmental health program recruit scientific personnel of various kinds?

Many organizations--professional groups, governmental and voluntary agencies, and schools and colleges--provide excellent avenues for publicizing job openings and rendering placement services. These channels are well-known and perform a valuable service in bringing together personnel and positions. They are generally limited, however;

to a single professional or occupational group. A central resource on personnel in various health specialties is needed for community agencies in search of personnel from the national manpower pool. The National Health Council should establish a "Health Manpower Clearing House," which would maintain current lists of health manpower in the various specialties.

To bring employment services to the local level, health and welfare councils, together with public agencies and local occupational groups, should maintain a roster of openings in health careers and of personnel available at the community level. The United States Employment Service could be helpful in developing a central employment registry for health personnel.

At a time when new health programs are developing and new kinds of personnel are needed to staff them, publicizing the program itself and its special manpower needs may be an effective means of recruitment. Newspaper publicity and small conferences on community mental health programs or rehabilitation programs, for example, may be able to reach persons contemplating further training or inactive health personnel who are attracted by the objectives of the program. To develop this approach to recruitment, focused on a particular program, the federal government might well support demonstrations of recruitment techniques undertaken by state and local agencies and professional organizations.

CONDITIONS OF WORK

Effective techniques of recruitment can attract personnel to various specialties and jobs. Ultimately, however, the supply and retention of manpower in various health specialties are determined by the satisfaction the health worker derives from his job. Job satisfaction depends on many factors inherent in the situation or related to the individual worker. The most obvious factors concern salaries and working conditions, but the legitimate desire for recognition, nonmonetary rewards, and the privilege to engage in decision-making also influence job satisfaction and staff morale among all levels of personnel. For professional personnel, intellectual stimulation seems to be most crucial to work satisfaction, with second importance attached to freedom and security.[56] Professional and occupational groups are in the best position to examine the relation of recruitment to job content and satisfaction, to wages and working conditions, and to opportunity for mobility and advancement, but comments are offered here on a few specialties to illustrate the relation of conditions of work to recruitment.

In dentistry, widened use of dental hygienists and dental assistants as a general pattern in dental practice would not only extend dental services to more patients but would also increase the attractiveness of dentistry as a profession. By relieving dentists of much of the routine work, such personnel can free highly-trained dentists for diagnosis, supervision of therapeutic regimes, and increased specialization. In this way, not only will the skills of dentists be more effectively used, but the content of dental practice will be brought in line with the extensive training the dentist has received. Moreover, as was pointed out in Chapter III, the use of auxiliaries increases the income of dentists significantly.

Increased mobility of dentists would also provide an incentive, particularly for women, to enter the profession. To this end, licensing requirements for dentists should be examined in every state to see whether the restrictions are justified.[57] Recognition of the examinations of the National Board of Dental Examiners by every state would facilitate the free movement of dentists and would encourage women, who want to be able to move their profession with their families, to enter the field of dentistry.

Although working conditions in the nursing profession have improved markedly since the war, the next 15 years must bring comparable progress if sufficient numbers of nurses are to be recruited and retained. "It is necessary to note, without arguing the point," wrote Henry David for the National Manpower Council, "that the size of supply trained for certain professional fields, notably nursing and teaching, can be subsequently decimated because of relatively poor working conditions and pay, low prestige, and other factors. In these two professions, as well as others, the retention of individuals already prepared is as significant a problem as the attraction of new entrants into the occupations."[58]

Improved wages, hours, vacations, and other benefits are fundamental to increasing the attractiveness of the nursing profession. Salaries for general duty nurses vary greatly in different places. Minimum starting salaries ranged from $55 to $100 a week in 15 metropolitan areas in 1960, and average salaries for general duty nurses (both beginning and experienced) ranged from $65 to $89 a week.[59] The nurse with three years' training usually receives the same starting salary as the beginning nurse with four years' training. Salaries of public health nurses are lower, on the average, than those of school nurses employed by boards of education. Compared with teachers, the Surgeon General's Consultant Group on Nursing points out, the median annual salary of staff nurses is low and their periodic raises are less (a teacher in New York City after 14 years' service may earn almost twice as much as a nurse with the same tenure). Moreover, fringe benefits of nurses--vacations, sick leave, and retirement provisions--do not compare favorably with those of other professional groups.[60] To increase recruitment of nurses, salaries should be raised, hours of work should be made more flexible, and more opportunity for part-time work should be offered to nurses in hospitals, public health programs, and industrial nursing positions.

Health departments and other public agencies with health programs have numerous vacancies in budgeted positions for professional and technical personnel. A study of 269 official health departments employing 30 or more full-time personnel in 1961 found that 11.3 percent of the budgeted positions for professionals were vacant--7.2 percent for engineers, 7.9 percent for nurses, 9.6 percent for physicians, and 15.8 percent for social workers. It was estimated that there were 5,000 vacant professional positions in state and local health departments in 1962.[61]

The difficulties these agencies face in recruiting personnel in short supply are related, in large measure, to the less attractive conditions of work in public service than in other fields. Salaries and fringe benefits are frequently not competitive with conditions in other jobs, and these disadvantages are compounded by rigid residence requirements, legal requirements for experience, competitive examinations offered at limited times, strict administrative regulations governing hiring and promotion, and limited training and development programs. The time has come for public agencies, as well as professional and occupational groups, to review and revise conditions of employment in public health programs. A model of the kind of analysis that would be helpful in recruitment is exemplified by the Brookings Research Reports on the professional personnel crisis in New York City and on the problems of recruitment to the federal service.[62]

ESSENTIALS FOR RECRUITMENT

Recruitment to nearly every health profession and occupation would be more effective if working conditions and opportunities for career satisfaction were improved. It is the task of health agencies and of professional and occupational groups to analyze the causes of discontent and to strive for remedial measures. State health departments, or other agencies responsible for planning for health manpower, should assign top priority to mobilizing individuals, agencies, and professional and occupational groups to examine and improve working conditions and opportunities for career satisfaction in all fields of health service. In this connection, the following conclusions may be helpful:

1. A large supply of potential personnel is available, but these persons will enter and remain in the various health occupations only as incentives are offered, and of these incentives one of the most important is adequate economic reward commensurate with the job and with comparable jobs.

2. At least equally important as financial remuneration is any step that will increase job satisfaction, dignify the job, and establish its importance. The pattern of team work can contribute to staff morale by associating personnel of various levels of training in the total health objective.

3. For all health personnel, and particularly for technicians and auxiliaries of all kinds, the opportunity for further training and advancement is an important attraction. On-the-job training, short-term training, educational leaves of absence, and interagency exchanges of personnel are all incentives for recruitment to a dynamic field of work with opportunity for advancement.

4. Licensing requirements for optometrists, dental hygienists and assistants, and others are designed to set standards and to protect the public, but arbitrary differences in licensing requirements from state to state impede mobility of these essential specialists and deter recruitment and retention. Licensure requirements should be examined in the effort to set uniformly high standards that also permit free interchange of personnel among states in relation to need.

5. For health personnel in public service, civil service regulations may be a negative, as well as a positive, force. Differences in rates of pay and retirement benefits within a state because of differing civil service regulations for the various units of government impede the retention and free movement of personnel.

RECOMMENDATIONS

The recommendations on recruitment of the Task Force on Health Manpower require a preface: that successful recruitment of health personnel depends on recognition of the dynamic and expanding character of community health services for which increasingly trained and specialized personnel will be needed in the years ahead. Only if educational attainment is increased will it be possible to enlarge the total pool from which health personnel can be drawn. The Task Force recommends, as measures to increase the supply of health manpower, that:

- Concerted efforts be made to interest students in health careers through improved counselling, work experience in health facilities, and expanded work-study programs. (Recommendation 11)

- Government at all levels, educational institutions, health agencies, and professional and occupational groups undertake positive measures to recruit health personnel from special groups that have not been fully tapped. (Recommendation 12)
- State health departments and other agencies responsible for manpower planning assign top priority to stimulating individuals, agencies, and occupational groups to examine and improve working conditions and opportunities for career satisfaction in all fields of health service. (Recommendation 13)

NOTES

(*See Bibliography for detailed annotation)

1. "Manpower in the 1960's," p. 37.*
2. Margaret D. West, 'Manpower for the Health Field: What are the Prospects?', "Hospitals," 37:18, September 16, 1963, Table 4.
3. "Manpower Report of the President and A Report on Manpower Requirements, Resources, Utilization, and Training," p. 218, Table B-11.*
4. Margaret D. West, 'Manpower for the Health Field: What are the Prospects?', "Hospitals," 37:18, September 16, 1963, pp. 82-88.
5. Wallace R. Brode, 'Approaching Ceilings in the Supply of Scientific Manpower,' "Science," 143:3604, January 24, 1964, pp. 314-315.
6. L. R. Harmon, 'Environmental Health Manpower,' Appendix C in "Report of a Conference on Educational Needs in Environmental Health."*
7. Henry David, 'Manpower Problems and Education,' "National Manpower Council, Education and Manpower," p. 14.* See also in the same volume, 'The Potential for Higher Education,' by the Council Staff, p. 227.*
8. Helen K. Powers, Address to Special Meeting of Professional and Citizen Organizations on Mental Health Manpower, June 10, 1964.*
9. Norman C. Harris, "Technical Education in the Junior College, New Programs for New Jobs."*
10. "Toward Full Employment: Proposals for a Comprehensive Employment and Manpower Policy in the United States," p. 5.*
11. See Chapter V, 'Education and Training of Health Manpower,' for the Task Force's specification of such criteria.
12. Arnold B. Barach, "USA and Its Economic Future," p. 68.*
13. "Manpower Report of the President and A Report on Manpower Requirements, Resources, Utilization, and Training," p. 75.*
14. Ibid., p. 75.*
15. Ibid., p. 75.*
16. "Special Report on Five-Year Trend in Graduate Enrollment and Ph.D. Output in Scientific Fields at 100 Leading Institutions 1959-60 to 1963-64," pp. 3-7.*
17. James A. Davis, "Great Aspirations: Career Decisions and Educational Plans During College;" Norman Miller, "One Year After Commencement," p. 38.*

18. "Special Report on Five-Year Trend in Graduate Enrollment and Ph.D. Output in Scientific Fields at 100 Leading Institutions 1959-60 to 1963-64," p. 2.*

19. Marion E. Altenderfer and Margaret D. West, "How Medical Students Finance Their Education."*

20. S. Warkov, "Subsidies for Graduate Students."*

21. Joseph Ceithaml and Davis G. Johnson, 'Nonrefundable Grants for Medical Students in U.S. Medical Schools,' "Journal of Medical Education," Vol. 40, 1965, p. 245 at 263.

22. S. Warkov, "Subsidies for Graduate Students."*

23. David G. Johnson, 'The Study of Applicants,' "The Journal of Medical Education," Vol. 39, October 1964, p. 899.

24. "The Survey of Dentistry," Table 145.*

25. Ibid., p. 265.

26. Ibid., p. 282.

27. "Toward Quality in Nursing, Needs and Goals," pp. 29-31.*

28. "Education for the Health Professions," p. 16.*

29. "Toward Full Employment: Proposals for a Comprehensive Employment and Manpower Policy in the United States," p. 72.*

30. "Manpower in the 1960's," p. 4;* "Manpower Report of the President and A Report on Manpower Requirements, Resources, Utilization, and Training," p. 274. Table H-8.*

31. Dietrich C. Reitzes, "Negroes and Medicine"; *and Subcommittee on Employment and Manpower of the Senate Committee on Labor and Public Welfare, U.S. Senate, "Toward Full Employment: Proposals for a Comprehensive Employment and Manpower Policy in the United States," 1964, p. 101.

32. Ruth M. Raup and Elizabeth A. Williams, 'Negro Students in Medical Schools in the United States,' "Journal of Medical Education," 39:5, 1964, p. 444.

33. Ibid., p. 444.

34. "Manpower Report of the President and A Report on Manpower Requirements, Resources, Utilization, and Training," p. 97.*

35. The efforts of university students and faculties in tutoring high school and college students with meager educational background are an encouraging development. The Provident Clinical Society, a Chapter of the National Medical Association, has involved 23 physicians, 6 dentists, and 2 pharmacists in Brooklyn, New York, in a program of weekly meetings with promising students and their families to 'raise the sights of these students' and not to let them settle for 'a career choice below their ability,' "New York Times," October 6, 1964, p. 23.

36. In 1960, there were 1,797,243 women employed in health services as compared with 780,971 men. "Manpower in the 1960's," p. 5, Table 3.*

37. 'Characteristics of the Population,' "United States Summary, U.S. Census of Population: 1960, Vol. I," Part I, Table 201.*

38. James A. Cunningham, M.D., 'Meeting the Demand for Technically Trained Personnel in the Medical Laboratory,' "Bulletin of the College of American Pathologists," June 1964, p. 102.

39. "Manpower Report of the President and A Report on Manpower Requirements, Resources, Utilization, and Training," p. 245, Table E-7.*

40. "American Women," p. 10.*

41. Grant Venn, "Man, Education and Work, Postsecondary Vocational and Technical Education," p. 26.*

42. Margaret D. West, 'Manpower for the Health Field: What are the Prospects?', "Hospitals," 37:18, September 16, 1963, Table 5.

43. "American Women " states under the caption 'Room at the Top': "Many able girls graduating from high school do not go on to college, and the fields of specialization of those who do go cluster rather closely in education, social sciences, English and journalism. It is particularly at the graduate level, however, that women fall behind. The number of women earning B.A.'s was 5,237 in 1900; 76,954 in 1940; and 145,514 in 1961. But since the war, the percentage of M.A.'s to B.A.'s has not risen as it did in the previous period; it has remained static at between 16.2 and 18.8 percent, standing at 16.8 percent in 1961. There has been similarly little change in the percentage of Ph.D.'s. In 1961, women earned 24,481 M.A.'s and 1,112 Ph.D.'s; the comparable figures for men afford a sharp contrast--54,459 M.A.'s and 9,463 Ph.D.'s." (p. 69).*

44. 'Women in Medical Schools,' "Datagram," 7:8, February 1966, pp. 518-19.*

45. Nell S. Talbot, 'Women in Dentistry,' "The Survey of Dentistry," Appendix C; see footnote 23, Table C-1, giving the approximate percentages of women dentists in various countries in 1958.*

46. Grant Venn, "Man, Education and Work, Postsecondary Vocational and Technical Education," p. 26.*

47. "Toward Quality in Nursing, Needs and Goals," pp. 29-31.*

48. Ray E. Brown, 'Report of Survey of Nursing Education in North Carolina,' July 1964; and 'Oklahoma Finds New Way to Ease Nurse Shortage,' "Medical World News," October 23, 1964.

49. "Recruitment for Personnel in the Health Field"; "Health Careers Recruitment; Progress Problems; Project Suggestions for National, State and Local Action"; "Proceedings," Midwest Regional Health Careers Recruitment Conference, New York, 1963.

50. Eli Ginzburg et al., 'Occupational Choice,' as cited by Grant Vean, in "Man, Education and Work, Postsecondary Vocational and Technical Education," p. 26.*

51. Israel Light and Julian A. Wallter, 'Doorways to Health Careers Through Biology,' "The Science Teacher."* (September 1961).

52. For a discussion of this development, see Chapter V, 'Education and Training of Manpower.'

53. Dr. Shailer Peterson, "Recruitment for Personnel in the Health Field."*

54. Kevin P. Bunnell, "Health Careers Exchange."*

55. See descriptions of statewide programs for recruitment to health careers in North Carolina and Texas, 'Teen-agers Learn about Health Careers at State-Wide Conferences,' "Hospitals," 38:20, October 16, 1964, pp. 74-76.

56. Solomon Rettig, Frank N. Jacobson, and Benjamin Pasamanick, 'The Motivational Pattern of the Mental Health Professional,' "Psychiatric Research Reports 10," American Psychiatric Association, 1958.

57. In California, the Advisory Committee on Dental Education and Dental Manpower Needs of the Coordinating Council for Higher Education has recommended changes in licensure requirements. "Report on Dental Education and Manpower, 1964." Other states are also reviewing this problem. For recommended changes in dental licensure, see "The Survey of Dentistry," Table 145.*

58. Henry David, 'Manpower Problems and Education,' "National Manpower Council, Education and Manpower," p. 14.*

59. 'Employment Outlook for Registered Professional Nurses, Practical Nurses,' "Occupational Outlook Handbook."*

60. "Toward Quality in Nursing, Needs and Goals," pp. 29-31.*

61. "Second National Conference on Public Health Training."*

62. David T. Stanley et al., "The Professional Personnel Crisis of the City of New York";* see also Franklin P. Kilpatrick, Milton C. Cummings, Jr., and M. Kent Jennings, "What Americans Think of the Federal Service."*

CHAPTER V

Education and Training of Health Manpower

Adequate staffing of community health services in the decade ahead cannot be achieved by an increase in numbers of health personnel alone nor even by the most effective use of health manpower. Personnel of high quality are essential. Personnel who are poorly qualified, even in large numbers, cannot do the job. The quality of personnel depends fundamentally on their selection, education, and training. Medical technicians who are poorly trained cannot produce reliable laboratory work; medical record librarians without proper academic preparation cannot establish and maintain the systems of medical records essential for modern medical care; nurses trained in substandard hospital schools of nursing cannot provide the nursing service that advances in medicine require; environmentalists with limited education and horizons are no match for the scientific, technical, political, and administrative problems in environmental health that lie ahead.

Other task forces of the National Commission on Community Health Services have recommended measures to raise the level of health services and to expand their scope. But a system of health services can be only as good as the people who render the services. So much has been said and, in fact, done about improved education for the health professions and allied occupations in recent years that it would be presumptuous for this Task Force to undertake an analysis of the numerous facets of education and training for each of the many health specialties. That must be left to the able specialists in each field. The objective here is rather to synthesize the best thinking of educators and health practitioners and to set forth minimum, essential measures that will strengthen the education and training of various categories of health workers.

BASIC VIEWPOINTS

The paradox of a society plagued by pockets of unemployment and technological displacement of workers, on the one hand, and a shortage of skilled personnel, on the other, calls for increased education of larger numbers of people. The health services will continue to suffer from a shortage of professional personnel unless the capacity of educational institutions is enlarged. There is no lack of candidates who could be trained for auxiliary health occupations. As automation displaces workers from industrial jobs, they may become available for positions in the health services if suitable educational resources are available.

Before turning to specific educational problems in the preparation of various kinds of manpower for community health services, several viewpoints which the Task Force has adopted as basic to the establishment of an effective educational system for the health services should be stated. These are:

1. The capacity of schools, colleges, universities, and professional schools must be expanded to permit the enrollment of adequate numbers of students.
2. Equality of educational opportunity must be assured in fact, as well as in words, for persons from all economic groups, all races and religions, and all geographic areas of the country.
3. As a measure to raise the quality of education for the health services, priority should be given to preparing and recruiting highly qualified faculties in all institutions of higher education.
4. The content of education for the health services must be enriched. Education of health manpower should be based increasingly in colleges, universities, and medical centers in order to foster interdisciplinary curricula and to raise specialized training to the highest level. At the same time, educational experiences in the world of community health services should be incorporated in order to develop health personnel attuned to community needs. Dynamic programs of continuing education are essential to equip health personnel for changing duties and roles.
5. Among the sources of financing for education of health manpower, by far the most important, because of its tax base, is the federal government. Continued and expanded federal support for educational institutions is essential to assure an adequate, equitable, and stable economic base for expansion of educational facilities. Financial aid to students of limited means from all sources must be increased.

THE ROLE OF THE TWO-YEAR COLLEGE

The many kinds of allied and auxiliary health occupations discussed in Chapter II, "Health Manpower Resources," and listed in Tables 1 and 2 require varied kinds of preparation. Public school systems prepare some of these workers; two-year and four-year colleges prepare others; still others are prepared in independent schools of optometry, podiatry, and dental hygiene, and in hospital nursing schools. Standards for education of these many kinds of workers are determined in large measure by state licensure laws, but other forces outside the school also influence the content of educational programs--requirements for certification and accreditation by professional and occupational associations; federal, state, and municipal civil service regulations; and federal programs for aid to vocational education. Educational institutions engaged in preparation of allied and auxiliary health workers, of course, bear the main responsibility for the quality of education provided, but professional and occupational groups can, through continuing review and assessment of requirements for certification and licensure, help to improve education for these health workers.

The most promising development in the training of allied and auxiliary health personnel is the great growth in two-year colleges in recent years. In 1963, more than 700 junior colleges (470 public and 238 private) had a total enrollment of 847,572 students.[1] These colleges, with free or low tuition and within easy commuting distance of the students' homes, are accessible to many high school graduates who could not otherwise afford to continue their education. Flexible admission requirements, moreover, attract students to preparatory programs, which permit transfer to four-year colleges and to terminal programs in various technical or vocational specialties.

Until recent years, most of the programs in two-year colleges have been designed for students intending to transfer to four-year colleges.[2] The possibility of developing programs of technical or vocational education in two-year colleges that might still admit of further education at a later time has not yet been fully explored. Although colleges do not generally recognize vocational training as college credit, the inclusion of basic college courses in vocational curricula of two-year colleges should be tried as a means of enriching vocational education and encouraging able students to seek further education.

Health curricula in two-year colleges are still inadequately developed, both in numbers and content. While only four states do not have any health curricula in their two-year colleges, the range of health occupations for which preparation is offered varies considerably. Even states with highly developed systems of two-year colleges do not offer preparation in all the health occupations. Of 47 junior colleges in New York State in 1960, 30 offered no courses in some 12 basic health occupations; of Pennsylvania's 27 junior colleges, half offered none of these courses, and five had only one course.[3] In 1965, of the 71 public junior colleges in California, 20 offered no health curricula and 12 offered only one course.[4] The first task is to expand the numbers and kinds of health curricula in two-year colleges and to assure the availability of these programs throughout the nation. Priority should be given to the preparation of nurses, sanitary technicians, auxiliary veterinary personnel, dental hygienists and dental assistants, physical and occupational therapy assistants, and mental health aides or assistants.

In the expansion of these programs, consideration should be given to the development of a core curriculum in the biological and social sciences that would broaden the education offered beyond the technical requirements of each occupation. Such a core curriculum, together with the specialized training for each occupation, would prepare personnel for community health services on completion of the two-year programs and would also provide a foundation for further education at a later time. Health programs in two-year colleges, although oriented primarily towards preparation for an occupation, should not be a dead end for those students who are academically able to undertake further study.

The immediate problem in launching such expanded health programs in the two-year colleges is to secure properly-qualified faculties. A deliberate effort must be made by universities, and particularly by schools for the health professions, to produce teachers for these programs.

Health curricula in two-year colleges should be developed in close functional relation to health service organizations and to institutions of higher education. Affiliation with a medical center, hospital, or other health facility is essential to prepare personnel equipped to serve as members of a health team providing comprehensive personal health services. With proper planning and development on regional and state levels, health programs in these colleges can serve the immediate needs of community health services for auxiliary personnel of many kinds and can also direct certain students towards the goal of further education.

Education for the health occupations should thus be developed in two-year colleges that fulfill the requirements of sound curricula, qualified faculty, and affiliation with a health facility. Universities, professional schools, and health agencies can help the two-year colleges to meet the challenge of preparing increased numbers of qualified health personnel.

Standards for programs of health instruction in the two-year colleges should be developed with the guidance of nationally recognized accrediting agencies. In nursing education, for example, the National League for Nursing should be involved in the development of educational programs for technical nurses in two-year colleges.

ROLE OF LIBERAL ARTS AND GRADUATE EDUCATION

"Education is clearly the wellspring of manpower development," states the United States Department of Labor,[5] and, it might have added, college education is the wellspring of development of all professional manpower. The increase in the number and proportion of college graduates which has already taken place and which is expected to continue constitutes a rich source of manpower for positions in the health services requiring baccalaureate education and for candidates for graduate education and professional schools.

Baccalaureate education for selected kinds of health workers--nurses, pharmacists, nutritionists and dietitians, social workers, sanitarians, and laboratory scientists--is discussed later in this chapter. Here it suffices to emphasize that a broad background in the liberal arts is essential preparation for work in modern community health services. Irrespective of the field of academic concentration and the occupational goal of the college undergraduate, all students preparing to work in health services should have basic courses in the biological, physical, and social sciences. On-the-job training can then be provided by agencies and institutions, much in the way that business has long done, to supplement basic education with specialized instruction in techniques and methods.[6]

New knowledge in the health sciences is largely the result of expansion of research in universities. Programs of graduate education and their preparation of personnel for continued and expanded research in the biological, physical, and social sciences are prerequisites for the solution of the increasingly complex health problems of modern society. Efforts to increase enrollment in programs of graduate study, however, should not jeopardize the quality of preparation. A definitive study of the supply of scientific manpower concludes:

> "The approaching ceiling in the supply of manpower in science and engineering requires emphasis on more than increased numbers if we are to increase the strength of our technology. We need to improve the quality of our educational program through

better selection of our students and acceleration and strengthening of courses based on the higher average competence attained through better selection. To compensate for the limitations on the number of students selected for high-level graduate programs, we must produce an added number of technicians and technical assistants through special courses and junior-college-level terminal curricula."[7]

Graduate schools, moreover, are the source of college and university teachers. The present shortage of qualified faculty for colleges and universities will not only continue but may become increasingly critical as enrollments expand in colleges and graduate schools.

Medical Education

The United States has a system of medical education second to none, and yet the Coggeshall Report of 1965 has issued a ringing call for "more and better prepared physicians."[8]

The urgent need for increased numbers of physicians has been documented in Chapter II. Even the projected expansion of the nation's 85 medical schools and five osteopathic schools will not produce enough physicians by 1975 to maintain the present ratio of physicians to population. This ratio, moreover, does not compensate for increasing specialization among physicians, declining numbers of physicians in practice, inequitable distribution of physicians, unmet health needs, or increased demand for physicians by reason of new programs, such as medical care for the aged. Only by continued reliance on foreign graduates can the present ratio be maintained; but, as the President's Commission on Heart Disease, Cancer and Stroke has stated, "Clearly the United States should not be a debtor nation in terms of medical manpower."[9] To some extent, the critical shortage in the supply of physicians can be met by effective use of medical manpower--by such measures as are suggested in Chapter III to increase the productivity of physicians. Even the most energetic and imaginative steps along this line, however, will not obviate the necessity for training more physicians.

The main bottleneck in increasing the number of physicians is the limited capacity of American medical schools. There simply are not enough places for the number of qualified applicants. For every first-year medical school place nearly two qualified candidates apply. In the decade from 1954 to 1964, the number of applicants to medical schools increased by 35 percent, but the number of first-year places increased by only 16 percent.[10] Pressures for admission to the limited number of places will probably increase in the years ahead.

Every recent study of the problem of the shortage of physicians from the Bane Report of 1959 to the DeBakey and Coggeshall Reports of 1965 has recognized that the fundamental measure necessary to increase the supply of physicians is to establish new medical schools and to expand existing ones. Funds available under the Health Professions Educational Assistance Amendments of 1965 provide renewed aid to medical educators in their efforts to achieve this goal. The public must recognize that the shortage of doctors cannot be corrected unless federal aid to medical schools is continued and increased.

Another way to increase the number of physicians is to improve the utilization of medical schools. Year-round use of facilities and midyear admissions are being undertaken. Special programs should be expanded to permit gifted students to complete their medical education in six years after graduation from high school instead of the usual seven or eight years.

Utilization of medical schools could also be improved by preventing vacancies in second and third-year classes. At present, five to six percent of the second-year places in the nation's medical schools are vacant and approximately 10 percent of the available third-year places.[11] If the third-year vacancies were filled, 1,000 additional physicians could be graduated each year without any expansion in facilities. The creation of either one-year or two-year programs in medicine in universities capable of providing the necessary academic strength and financial support would permit students to complete their medical education in existing medical schools and to fill all the places. Those who support the two-year medical school caution, however, that such programs should be undertaken only where conditions are favorable for the eventual evolution of a four-year medical school.

Medical schools of the future not only must prepare increased numbers of physicians but must also prepare them more appropriately for community medicine than at present. The vast complex of organized medical services requires physicians trained in community-based medical care. Family health service programs, such as those at Cornell Medical School, the University of Kentucky Medical Center, Western Reserve Medical School, and Montefiore Hospital, have pioneered in developing programs of combined teaching, research, and community medicine. Didactic methods and hospital training alone are no longer adequate to prepare future doctors for their responsibilities in community service.

Medical school curricula and residency programs providing increased educational experiences in the setting of community medical care can be undertaken in various ways. Teaching programs in community-based medical care may be developed by one clinical discipline, such as medicine or pediatrics; by a department of preventive or community medicine; or by a multi-disciplinary unit of the medical school. Regardless of the sponsorship, all such programs should be designed to include the following elements: organization of services for family groups, providing continuity of care and including prevention, therapy, and rehabilitation; application of the concept of care by a health team; inclusion of knowledge drawn from the behavioral sciences on a more systematic basis than in the past; participation of medical students in community health programs; and appropriate mechanisms for assessing the educational effect of such programs.[12]

Educational programs of this kind, if skillfully conducted, will yield more than the dividend of better prepared physicians. They will facilitate the participation of medical school faculties in the preparation of auxiliary health personnel--a responsibility which they must partly assume in addition to their primary responsibility for medical students. Programs of community medicine can thus provide a suitable framework for the preparation of many kinds of health personnel in a team setting. And, by strengthening the liaison between medical schools and community health organizations, educational programs in the community setting will serve to raise the quality of community health services.

Dental Education

The shortage of dentists is even more acute than the shortage of physicians. Merely to keep pace with population growth and the present demand for services, it will be necessary to build and equip two new dental schools per year for ten years, each with a class size of approximately 100 students.[13] Even maintaining the present dentist-population ratio is unlikely to produce enough dentists to correct the maldistribution of dentists in rural areas, to handle the backlog of dental need, or to meet the effective demand for dental care as it mounts with prepayment plans and increased public appreciation of dental health.

While every effort must be made to develop new dental schools and to expand existing ones, the only realistic hope for meeting dental manpower requirements in the immediate years ahead lies in augmenting the productivity of dentists through the training and effective use of sufficient numbers of auxiliary dental personnel.[14] For this reason, dental schools must prepare dental students in the efficient and judicious use of dental hygienists, dental technicians, and dental assistants. Present efforts in this direction must be intensified and accelerated so that every dental school makes instruction in methods of working with auxiliary personnel an integral part of its program of clinical teaching.

At the same time, the faculties of dental schools have a responsibility in expanding the training of dental auxiliary personnel. Dental schools should work with two-year and four-year colleges in planning the development of training programs and should also, where feasible, provide faculty to participate in the preparation of auxiliary dental personnel. Several dental schools and dental institutions are now conducting experiments designed to broaden the functions of the dental hygienist. In imaginative investigations of expanded roles for auxiliary dental personnel may lie the key to the dental manpower shortage. While the primary responsibility of dental schools is to prepare dentists, their leadership in the training of auxiliary dental personnel is essential if enough dental manpower is to be produced to meet the future demand for services.

The Commission on the Survey of Dentistry has made detailed recommendations to improve dental practice and dental education.[15] This Task Force stresses only a few of the measures needed to strengthen the quality of teaching in dental schools. First, all dental schools should increase the number and proportion of full-time faculty members. Part-time teachers are still an important segment of the faculty, but such practicing dentists should serve at least half-time in dental schools. Second, in order to recruit and retain qualified faculty, dental schools must provide them with adequate salaries and other benefits. One benefit, of particular importance to part-time faculty, is the liberalization of state licensure laws. As long as practicing dentists are needed as part-time faculty, licensure laws should not bar the recruitment of able teachers. Third, dental and medical schools, wherever possible, should be located on the same campus. Personnel and facilities can be conserved through joint appointments, joint teaching programs, and use in common of certain clinical, laboratory, and lecture facilities.

The trend towards the provision of comprehensive health care in community hospitals and in community health centers requires the education of dental students in hospital dentistry and in working with other members of the health team--with physicians, nurses, social workers, and others. Expanded programs of medical care for the aged will involve the participation of dentists in the provision of dental care for elderly patients in the community and in hospitals before transfer to a nursing home. Preparation for working with other members of the health team can best take place in a university where numerous kinds of health personnel are being prepared and in a hospital with a full complement of health personnel. Education in these settings will provide experience in maximum use of expensive equipment, in procedures to provide comprehensive health care, and in coordination of the work of health personnel from various disciplines.

Nursing Education

The great attention given in recent years to nursing education and the role of the nurse on the health team has resulted in agreement on one principle: that nursing personnel must be prepared for the varied functions that they will perform in many settings. As nursing education has moved into institutions of higher education, the focus on the care component as nursing's central contribution to the well-being of people has been reemphasized. At the same time, the vast growth of knowledge requires nurses to develop new technical skills and to perform some functions formerly the province of physicians. Emphasis on prevention of disease and health education requires the nurse, especially in public health programs, to motivate, educate, and support patients through services which encompass both case-finding and disease control. Wide use of auxiliary personnel of many kinds makes it imperative that nurses be prepared to assume team leadership. The increasing complexity of medical care organization calls for nurses qualified to assume responsible administrative positions. Achievement of the nation's manpower goals in nursing requires nurses of high caliber prepared for faculty positions in schools of nursing.

There are three main levels of nursing personnel today--professional, technical, and vocational. "Registered nurse" is a term that currently describes nurses of either the professional or technical level. The vocational level includes those licensed as practical nurses as well as a variety of other nursing assistants.

Educational requirements for these three levels of nursing personnel may be summarized as follows:[16]

1. Nurses of the professional level should be prepared in four-year colleges and universities which provide a broad liberal arts foundation with thorough education in nursing. Courses in the natural and social sciences should be included, and nursing instruction should be patient-oriented rather than technique-oriented. A goal of this educational program should be to develop understanding of human behavior in illness and an awareness of the power of nursing intervention in preventive, therapeutic, and rehabilitative procedures both in and out of hospitals. Nurses prepared in these academic programs should be equipped to think independently, to analyze problems scientifically, and to provide care in conjunction with other members of the health team.

2. Nurses of the technical level should be prepared in two-year colleges with appropriate clinical experience in affiliated hospitals. Courses in the natural and social sciences should provide a base for future technical responsibilities, but in addition some courses in the humanities should be included to broaden the background of these nurses. Clinical experience provided in affiliated hospitals should be designed to assist students to apply basic nursing principles, to demonstrate the reasons for certain procedures, and to develop skills.

The broadened background of technical nurses prepared in two-year colleges will not only enhance their nursing skills, but in certain cases may also facilitate their admission to baccalaureate and graduate education. In line with usual practice in fields which colleges and universities label as technical, a registered nurse from a hospital diploma program who seeks a baccalaureate degree receives little or no credit for her nursing preparation. Many able technical nurses who might become professional nurses are thus discouraged from undertaking further education. Wherever possible, qualified nursing students should be encouraged to enroll initially in two-year colleges and in baccalaureate programs.

3. Vocational nursing personnel (practical nurses and nursing assistants) should be prepared in programs which are part of a system of vocational education. The nursing profession, however, has responsibility for enunciating standards, and such programs must be closely affiliated with hospitals and other health agencies. Unlike practical nurses, nursing aides or auxiliaries have been largely prepared through on-the-job training. Recently, however, nursing has advocated that preparation of assistants in the health service occupations should be short. Such preparation should include intensive preservice programs in vocational education institutions with adaptation to job requirements in an individual hospital or health agency through orientation and inservice education.

Trends in enrollment for each of the programs of nursing education show an increase in associate degree, baccalaureate, and post-baccalaureate programs, while the number of hospital diploma programs and enrollments have declined. The marked increase in numbers of vocational programs and admissions to them has been fostered by the Manpower Development and Training Act and other recent legislation. Yet increased numbers of practical nurses and other nursing assistants, important as they are, cannot assure adequate nursing service without qualified supervision. (See Chart I).

The Surgeon General's Consultant Group on Nursing emphasized the critical need for more nurses with advanced preparation in

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CHART 1. NURSING EDUCATION IN RELATION TO FUNCTION

Nursing Level	Education	Function
Professional	Master's or doctoral degree	Teaching Research Administration Consultation Supervision Specialized clinical services
Professional	Bachelor's degree	Nursing measures appropriate for sick or well people regardless of the setting: hospital, home, clinic, school, industry, etc. These measures include: Providing patient care Carrying out delegated medical techniques Planning and evaluating a program of care Guiding work of nursing team Coordinating with other members of health team
Technical	Associate degree from 2-year college or, during an interim period, diploma from hospital program	Nursing measures delegated by and subject to guidance by professional practitioner. These include: Delegated medical techniques Planning day-to-day aspects of care Supervision of others in technical aspects of care
Vocational	Completion of a preservice program in vocational education	Aspects of patient care delegated under supervision by professional or technical nurse

Source: Adapted from 'Data on Programs in Nursing Education,' in 'Educational Programs in Nursing and Related Career Opportunities,' "Journal of the American Medical Association," Vol. 185, No. 2, p. 144, July 13, 1963.

baccalaureate and graduate programs.[17] The greatest need, the Consultant Group said, will be for nurses in hospitals and related institutions, where 525,000 registered nurses will be required by 1970, compared with the present supply of 390,400 nurses employed by hospitals and related institutions in 1964.[18] Many must be technical nurses trained in two-year programs.

The shift in the education of technical nurses from hospital diploma programs to two-year colleges with hospital affiliations is a sound step to upgrade nursing education, but in the process every effort must be made to guard against a decline in the supply of nurses. Where a diploma nursing program is now operating in a locality which lacks a two-year college, appropriate consultation over a period of time can help with delineation of the nature of technical education and exploration of future direction. The tradition of concern for patients and high standards of service which has been characteristic of many hospital schools can be a valuable asset in continuing to supply nurses for the community. Certainly, the timing of steps to be taken during a transitional period will vary from one part of the country to another depending upon availability of educational and clinical resources. Haste and shortcuts have no place in the development of sound programs of nursing education for the future.

Recognition of the severe shortages in nursing personnel as well as of changing functions of all health personnel makes imperative continued experimentation and innovation in the use of nursing personnel, especially at the supportive level.

Education for Community Health Services

The provision of community health services through a complex network of agencies requires many kinds of professional, technical, administrative, and auxiliary personnel, as well as staff for planning and research.

Although several kinds of educational institutions prepare some students who eventually find their way into community health services, the main responsibility for education in community health is and should be that of the schools of public health. Instruction in the many specialized fields of community health services can best be provided by schools that combine a public health point of view with expert presentation of the subject-matter in the biological and social sciences relevant to health services. In the light of expanding and changing needs in community health services, schools of public health should re-examine their role and responsibility in the education of both specialists and generalists for community health programs. The Committee on Professional Education of the American Public Health Association has made an excellent beginning in its "Criteria and Guidelines for Accrediting Schools of Public Health." The report of the Joint Committee on the Study of Education for Public Health, "The Education of Public Health Personnel," published in October, 1965, examines the objectives and curricula of schools of public health. Continuing review of educational programs is necessary to assure the preparation of personnel equipped to provide modern community health services.

Restrictive admission requirements of some schools of public health should be revised. For example, the prerequisite of experience in public health should be abolished. It is a relic of the time when personnel employed in health agencies were thought to be the only persons interested in and qualified for graduate education in public health. Today, public health schools should seek to recruit students completing baccalaureate programs who are interested in and qualified for academic and professional education. Experience in operating public health agencies can be provided through supervised field training and academic residency training programs.

Since faculties of the schools of public health are actively at work to enrich their teaching programs, only the most general comments on the course of study are offered here. The 1965 Conference on the Teaching of Medical Care Administration, held at Ann Arbor, is an example of nationwide exchange on teaching problems in this growing specialty. The close contacts that schools of public health maintain with the world of community action are a means of inspiring changes in curricula as health needs and programs change. In general, it should be emphasized that curricula for all specialties within public health should include study of both the biological and social sciences in proportions suited to the field of concentration. Involvement of faculties from other disciplines--the social sciences, biological sciences, law, engineering, and business and public administration--can enrich the preparation of students in public health.

One specialty in public health affects every program of community health services--health education. The most technically advanced programs of environmental health, communicable disease, and chronic illness involve the need for an effective health education component designed to change human behavior related to these problems.

The future will undoubtedly tax the ingenuity of health education specialists in their attempts to devise means for changing both personal health-related behavior as well as the public action of organized community groups concerned with health issues.

Schools of public health are currently considering ways in which their training of health education specialists may be more firmly rooted in behavioral science and the extent to which applied research might be part of this preparation. At the same time, complementary to and supportive of the graduate specialist, both schools of public health and professional associations need to analyze clearly the functions of health education personnel at all levels with a view to the possible role of health education assistants qualified at the bachelor's degree level.

An essential ingredient for raising the quality of personnel for community health services is the level of their education. The complexity of modern public health services requires increased numbers of personnel with advanced preparation. Schools of public health should develop and expand rigorous university programs for the preparation of personnel at the master's level, both with academic objectives of teaching or research (M. S.) and with professional objectives of community health service (M. P. H.). The length of preparation should depend upon the nature of the specialty and the background of the student. Physicians, dentists, nurses, and veterinarians may be able to complete postgraduate education in one year, but a longer period is required for students without previous background in the health field. The breadth of knowledge required for community health service cannot be provided for all students or in all specialties in a single academic year.

Schools of public health should also place increased emphasis on education at the doctoral level directed towards goals of advanced teaching and research in all fields of public health (Ph. D. or Sc. D.), as well as towards goals of high-level community health planning and service (Dr. P. H.). In both these forms of doctoral preparation, a major research exercise leading to a dissertation should be required. Until recent years, most of the public health workers with doctoral degrees held degrees in medicine or dentistry. Today the demands of community health services necessitate education on the doctoral level for increased numbers of persons other than physicians and dentists.

Education for Health Service Administration

The critical need for competent administrators for the many programs of health service requires special discussion of their educational preparation. Schools of public health and university programs of hospital administration should give top priority to the preparation of administrators of high quality in order to meet the need for planning and administration of health services and to spare clinical personnel for clinical duties. The wisdom of educational programs that prepare hospital administrators in the future should be encouraged in schools of public health, where adequate preparation can be afforded in the broad community aspects of health services, supplemented by necessary instruction in the business administration aspects of hospital operations.

In the field of medical care organization, a few schools of public health have recognized the need for preparation in health service administration and have developed graduate programs in this specialty. The U.S. Public Health Service has provided support for these programs through special purpose traineeships in medical care administration. In proposing "A Forward Program in Medical Care Administration for the American Medical Association" in 1962, Dr. Raymond L. White, then Director of the A. M. A.'s Division of Environmental Medicine and Medical Services, said of health service administrators:

> "This new profession may well be the keystone in the future guidance of medical care concepts as his counterpart has become in the field of hospital care. It is essential that he be well oriented in the philosophy and ethics of medicine, in medical economics and in medical care principles."

Graduate education in medical care administration at both the master's and doctoral levels is necessary. Since programs in medical administration leading to a master's degree are no longer new, emphasis is placed here on the need for preparing personnel in doctoral programs for high-level planning and administration. Dr. Milton I. Roemer has described the scope of such education as follows:

> "The need, in my view, is for a doctoral level program of training in health service administration of depth equivalent to that required for the M.D. degree, but different in content. The training should include enough background in the biological sciences to acquaint the student with the general nature of disease in the individual and the principal methods of treatment, but not the enormous span of basic and clinical sciences that one has to master to engage in diagnosis and therapy of individual patients. On the other hand, training in the social aspects of health and disease-control should be far richer than that offered in the typical medical curriculum. And education in the several administrative and social sciences should be broader than that now offered in either our schools of public health or medicine. Such an educational program would require about four years of study beyond the bachelor's degree, and I have outlined a possible curriculum content for it elsewhere. It would include, in summary, biological-clinical studies (15 units), social science (21 units), administrative studies (24 units), medical-social science

> applications (51 units), and electives, field studies, and dissertation up to a total of 133 college units.
>
> "The 'doctors of health service administration' turned out by such a program would be qualified to administer the public health services of a county or state or nation, for which physicians are now usually demanded. They would be competent to administer extensive medical care programs, large hospitals or hospital systems, special activities in the field of rehabilitation, and other functions for which nonmedical administrators--often poorly qualified--are now often engaged. At the same time, administrative personnel trained only to the master's level or the bachelor's level could occupy, as they do now, subordinate positions in the organized health service framework."[19]

Education for Environmental Health Services

The Surgeon General's Committee on Environmental Health Problems listed the wide variety of personnel needed "for a comprehensive attack on the problems of environmental health" as including:

> "...a broad range of individuals with backgrounds in the physical and biomedical sciences, in mathematics, and in the social sciences. In the physical sciences, representation extends from classical physics and chemistry through meteorology, geophysics, and radiation physics to hydrology, oceanography, and sanitary engineering; in the biomedical sciences the personnel requirements extend from molecular biology, botany, and microbiology through biochemistry, pharmacology, and radiobiology to epidemiology, toxicology, and the several medical disciplines. In mathematics, representation is required from classical mathematics through biomathematics and statistics. And the very nature of the problems encountered in environmental health makes essential the availability of personnel with background in sociology, political science, anthropology, and psychology."[20]

The Task Force on Environmental Health has divided this vast array of personnel into two main categories: (1) highly trained and frequently specialized engineers and scientific personnel to develop and direct technical programs and services, and (2) field staff to provide services including investigation, surveys, education, and enforcement.

At present, environmental health scientists constitute less than two percent of all scientists, engineers, and teachers of science. By 1970, double and, in some categories, triple the present number, will be required.[21] Expanded academic facilities will be needed to accommodate increased numbers of engineers, scientists, and technologists in doctoral programs to qualify them to design programs, carry out research, interpret scientific findings, and supervise the monitoring of programs of environmental control.

Clearly, the preparation of highly qualified specialists for development of programs and for research must take place in universities, their specialized graduate programs, and in academic centers of environmental health.[22] The way is now clear for the development of such environmental health centers through passage of the Health Research Amendments of 1965, which authorize the Department of Health, Education, and Welfare to enter into contracts with universities and industry for research and training of personnel. The funds are not restricted to the field of environmental health, but they will facilitate the expansion of educational programs in this specialty.

Two kinds of field workers are required in programs of environmental health service. First, there is a need for sanitarians trained in four-year colleges and qualified to conduct inspections and surveys and to monitor programs of environmental control. At present, sanitarians are prepared either in college courses in sanitary science or in a basic physical or biological science. Students intending to enter this field of work should be encouraged to pursue a course of study in a physical or biological science rather than in sanitary science, so that their B.S. degree will facilitate graduate education at a later time. Strong components of public health should be added to the basic sciences in this course of study. This education should then be supplemented by well-planned programs of on-the-job training. Health agencies must, like industry, recognize the long-term benefits of personnel with sound preparation and make the investment required for imparting techniques and methods.

A second kind of field worker is necessary for routine tasks--inspection and monitoring--in environmental health control. Environmental technicians should be prepared in programs in two-year colleges and equipped to serve as auxiliaries to sanitarians. This program should include courses in public health as well as in techniques of sanitary science. Qualified students, of course, should be encouraged to undertake baccalaureate programs wherever possible.

Education for Veterinary Medicine

The extensive knowledge developed by veterinary medicine of the relationships among plant, animal, and human life and of the consequences for the community of animal-borne diseases requires training of veterinarians in conjunction with training of public health and medical personnel. The time has passed when schools of veterinary medicine were suitably located on agricultural campuses apart from other schools in the health sciences. To equip veterinarians to bring their skills to programs of community health services, schools of veterinary medicine should operate in close conjunction with schools of public health, schools of medicine, and other schools in the health sciences.

Although some schools of veterinary medicine provide preparation in principles and concepts of public health, such education is far from general. Curricula in all schools of veterinary medicine should provide the student with an understanding of epidemiological principles and methods as well as of the interrelationship of veterinary medicine with modern community health programs.

Education for Pharmacy

The traditional role of the pharmacist in the composition and dispensing of drugs is changing as drugs are increasingly prepackaged by pharmaceutical manufacturers. The vast increase in the numbers and kinds of medications and the confusing use of proprietary names nevertheless requires the pharmacist to be au courant of the extensive pharmacological research and clinical trials of drugs. The pharmacist, moreover, is a central figure in the dissemination of health information, both to physicians and the public.[23] The fifth largest health occupation is thus faced with the need for educational preparation that qualifies pharmacists to serve as consultants to physicians and as health educators to the public.

Although pharmacy schools have recognized this expanding role of pharmacists in community health, very few courses in public health and health education are offered in the nation's 77 schools of pharmacy.[24] The shortage of qualified teachers hampers pharmacy schools in filling this need, it is true, but knowledge of public health concepts and of the world of health services is essential to enable pharmacists to take their place on the health team.[25] The inclusion of courses in public health in the pharmacy curriculum is one way of equipping pharmacy students to serve as community health workers. The faculties of pharmacy schools will undoubtedly find other ways of imparting to pharmacy students an understanding of their potential role as technical consultants to physicians and as health educators in the community with whom the public has direct contact.

Education for Nutrition and Dietetics

Increasing recognition of the importance of nutrition and diet in health maintenance and chronic disease control has brought into prominence the confusion and overlap in the functions of nutritionists and dietitians. This confusion has raised questions as to the propriety of the educational preparation for these categories of personnel.

Nutrition is the study of nutrient requirements and the subsequent metabolism of nutrients in the body. Nutritionists may be engaged in various pursuits--teaching, research, or public health nutrition. Dietitians are responsible for food preparation and service, administration of food facilities, therapeutic dietetics, and nutrition education, as well as ancillary functions relating to facilities and equipment and training of personnel.[26] In reality, however, the distinction between these two specialties is blurred. Public health nutritionists are concerned with the development of good nutritional practice and instruction for normal diets and modified diets in the treatment of heart disease, diabetes, arthritis, obesity, and with geriatric nutrition and diet counselling. Dietitians are also engaged in community nutrition programs and teaching.

Both nutritionists and dietitians are educated in four-year programs leading to a bachelor's degree in colleges and universities. Most positions for nutritionists require, in addition, experience or graduate education, either a public health degree or a Ph.D. in nutrition or biochemistry. Dietitians are required to complete a one-year dietetic internship approved by the American Dietetic Association and--to confuse the picture further--this internship may qualify dietitians for certain posts as public health nutritionists.

Clearly, as Dr. Roslyn B. Alfin-Slater has urged, schools of public health and schools of home economics, in cooperation with nutritionists, dietitians, biochemists, and their professional organizations should undertake a redefinition, reevaluation, and reclassification of positions in nutrition and dietetics according to functions, education, and experience in order to clarify the educational preparation and subsequent training necessary for each position.[27] Such a review might well differentiate the preparation required for teaching and research, on the one hand, from that required for programs of public health nutrition, on the other. At present, all undergraduate curricula in nutrition give a basic preparation which, with further education, could lead as readily to teaching and research as to public health nutrition. Therefore, only limited emphasis is given to the health aspects of nutritional science in undergraduate programs, even for those students who intend from the start to enter the field of public health nutrition. This deficiency is apparent particularly in undergraduate programs that have developed in colleges of agriculture and home economics and which are separated from health institutions. Redefinition of functions, new nomenclature, and professional certification are necessary steps to tailor education in this field to the several specialized roles of nutritionists and dietitians.

Education for Health-Related Social Work

The increasing organization of health services and emphasis on the problems engendered by chronic disease and aging have increased enormously the importance of professional social workers in the health team. Casework services for individual patients and their families are imperative. Social workers also serve as group workers, community organizers, program planners, consultants to health agencies, and administrators of health programs. Social workers engaged in family casework and in group work in nonhealth settings confront health problems at every turn.

Fortunately, graduate education in social work has been alert to the need for increased health content in the preparation of professional social workers. The 1959 Curriculum Study sponsored by the Council on Social Work Education, periodically revised since that date, has been influential in encouraging schools of social work to incorporate more teaching about health, illness, and disability. Problems of health and disease are not considered the exclusive province of students who expect to become social workers in medical settings, but rather basic knowledge for all professional social workers. Recent seminars and workshops have translated this principle into revised curricula and expanded field experience.[23] Continued efforts should be made to bring all 58 schools of social work up to the highest standards in teaching concepts involved in community health services and methods of providing such services.

One way to achieve this objective is to heighten cooperation between schools of social work and schools of public health. An informal group of social work teachers in schools of public health now meets annually. This liaison could be expanded and formalized. The Council on Social Work Education and the Association of Schools of Public Health should, it is submitted, establish a joint committee to develop patterns of interdisciplinary work and cooperation in teaching. Wherever schools of public health and schools of social work exist on the same campus, joint appointments and shared teaching responsibilities should be developed. Such cooperative teaching programs would go far to meet the need for qualified and specialized faculty.

The critical need for social workers to staff health agencies cannot be met from the supply of social workers with graduate education. Until more social workers are prepared, reliance must be placed on persons having a bachelor's degree with major emphasis on social welfare, with professional social workers reserved for supervision and consultation. Undergraduate programs in social welfare should therefore expand their enrollments of students in baccalaureate programs. Health agencies, through sound programs of inservice training, should seek continuously to strengthen the background of such personnel with baccalaureate degrees.

At present, two levels of graduate education for social workers exist: a two-year program leading to a master's degree in social work (M.S.W.) and a doctoral program. In Britain, the Younghusband report initiated discussion of the feasibility of establishing a master's program of one year's duration. This proposal has aroused considerable interest in the United States. Graduates of such programs would be much better prepared than persons with a baccalaureate degree in social welfare, but they would still have carefully delineated responsibilities. Through such one-year master's programs in social work, increased numbers of trained social workers could be prepared for the many positions for social workers in programs of community health service.

Social workers have important and expanding professional responsibilities in the fields of mental health and mental retardation. Expanding community mental health programs face acute shortages of qualified personnel. Although training grants from the National Institute of Mental Health provide assistance for preparing personnel, use of Congressional appropriations for support of mental health centers and mental retardation programs is impeded by the shortage of personnel. In order to assure enough psychologists, nurses, counsellors, and social workers for these programs, universities must accelerate their plans and expand their programs for preparing appropriate personnel. Increased cooperation among the various disciplines involved in the provision of mental health services could overcome bottlenecks in education. Innovations in education could also increase the supply of students. Two successful examples of such innovations are the training of mature, college-educated housewives as mental health counsellors and the preparation of master teachers to work in conjunction with lesser educated teachers in classrooms for the mentally retarded.[29]

THE ROLE OF CONTINUING EDUCATION

The postwar population explosion--central to the nation's manpower needs and resources--has been accompanied by a similar explosion of knowledge, which has profound implications for education of all manpower. Vastly increased research, new developments in science and technology, and investigations in every field have contributed to a growth of information, ideas, and knowledge that challenge our educational system. Continuing education throughout the working life of all personnel, regardless of level of education, has been addressed to the objective of keeping personnel abreast of the growth of knowledge in every specialty. The field of health services has responded to the need for continuing education with numerous and varied short courses, institutes, seminars, conferences, and postgraduate teaching programs. Funds have been provided from various resources and continuing education has become an integral part of many health programs. The new legislation on heart disease, cancer, and stroke, for example, specifically includes continuing education in the training programs to be established through regional cooperative arrangements among medical schools and institutions to make available to patients "the latest advances in the diagnosis and treatment of these diseases."

The majority of health personnel can take advantage of only a small fraction of the many programs of continuing education which now exist. This "embarrassment of riches" calls for reexamination of the quantity and quality of continuing education and determination of the principles that should shape such programs in the future. More than ever before, the whole of education has become a continuum, beginning with basic education, proceeding through professional and occupational education, including inservice training and practical experience, and extended thereafter by informal individual study and formal organized educational programs.

To differentiate between inservice training and continuing education, it is helpful to examine the definition of continuing education developed for public health by the Western Branch of the American Public Health Association:

> "...the organized and planned presentation of appropriate educational experiences at a professional level which are university oriented--not developed directly by the employing agency but related to its needs and programs, and directed at the exploration of new ideas, trends, developments and the exposure of new dimensions which improves the individual's professional competency and may be expected to exert a broad and long-range effect on the field."[30]

Formal continuing education should not be concerned primarily with implementation of health programs or teaching of specific techniques. These are more appropriately the subjects of inservice or on-the-job training provided by the employing agency. Nor should continuing education be concerned with development of specific programs. This is a matter for administrative personnel and related health agencies. Formal programs of continuing education should be concerned with the improvement and expansion of the individual's knowledge and of his competency to perform his role in the provision of health services.

Rather than analyze the needs and programs for continuing education in each specialized field of health service, this report will focus on a few general measures designed to improve the quality of on-the-job training and continuing education. These measures can then be interpreted and adapted to fit the needs of each professional and occupational group.

1. The responsibility for sustained education throughout the working life of all health personnel should be shared by universities and colleges, professional and occupational groups, and official and voluntary operating agencies. As sources of new knowledge, the universities should provide leadership in developing new and useful programs of continuing education. Professional and occupational groups and their individual members should stimulate such programs and participate in their execution. Official and voluntary agencies, including hospitals, should identify needs for continuing education and should provide funds and time for staff to take advantage of educational opportunities outside the agency. Cooperative efforts in continuing education between universities and professional organizations should be encouraged.

2. On-the-job training for new employees and inservice education for old employees should be provided by official and voluntary agencies. These agencies should also develop programs for the training and use of volunteer workers.

3. Innovations in methods of providing continuing education should be developed. Short courses have been exploited to the full. Other methods should be tried: postgraduate study at universities, visits of experts to work settings in hospitals and agencies, refresher courses, and others.

4. University medical centers and community hospitals should explore new methods of developing programs of continuing education in hospitals that bring together academic resources, the competence of health service personnel in the community, and the educational needs

of practicing physicians and other professional and occupational groups.

FINANCING EDUCATION OF HEALTH SERVICES PERSONNEL

Regardless of how well educated health personnel may be, the quality and quantity of all health care will surely decline from present levels if shortages in numbers become more acute than at present. Increased population and consumer demands for health services will strain the existing supply of health personnel. Adequate financing to expand facilities for training in order to enable increased numbers of students to undertake preparation for the health professions and occupations is the keystone to achieving an adequate supply of health manpower. At the same time, support for educational institutions can be directed to raise the quality of education.

Many groups contribute to the financing of education for the health professions and occupations--students, universities, government at the federal, state, and local levels; industry, private foundations, and individual benefactors. All these sources of funds are important, but most important, because of its tax base, is the federal government. The development of specialized manpower to meet the health needs of the people is a national concern; it is appropriate therefore that the federal government contribute adequate financial aid to educational institutions and to students to ensure the preparation of sufficient numbers of personnel in all categories and at all levels.

In recent years, vastly increased federal support has been provided for education for the health professions, as shown in Table 10. Initially, this aid was provided for construction and operational support of research in both public and private universities. The importance of this support for basic education for the health professions and preparation of college faculties cannot be gainsaid. Federal aid was then extended, under the Health Professions Educational Assistance Act of 1963, to educational facilities for the main health professions.

Similarly, Congress has authorized the use of funds for the training of specialized personnel of various kinds. Under the Mental Health Amendments to the Public Health Act of 1949, and the Health Research Facilities Amendments of 1965, funds are available for training in mental health, environmental health, and other fields. The Health Manpower Development and Training Act of 1962, as extended, and the Vocational Education Act of 1963 provide support for training of personnel with high school or less than high school education, including technical and auxiliary health personnel. (See Table 10.)

TABLE 10. FEDERAL LEGISLATION TO EXPAND FINANCIAL RESOURCES FOR THE TRAINING OF HEALTH MANPOWER, 1956--1965

Public Law	Title	Date	Purpose
84-911	Health Amendments Act of 1956 (Graduate Training of Professional Public Health Personnel) (S. 3958)	8/2/56	To improve the health of the people by assisting in increasing the number of adequately trained professional and practical nurses and professional public health personnel, assisting in the development of improved methods of care and treatment in the field of mental health, and for other purposes.
85-544	Public Health Service Act Amendment (H.R. 11414)	7/22/58	To amend section 314 (c) of the Public Health Service Act, so as to authorize the Surgeon General to make certain grants-in-aid for provision in public or non-profit accredited schools of public health of training and services in the fields of public health and in the administration of State and local public health programs.
86-610	International Health Research Act of 1960 (S.J. Res. 41)	7/12/60	To establish a national institute for International Health and Medical Research to provide for international cooperation in health research, research training, and research planning, and for other purposes.
86-720	Public Health Service Act Amendment (H.R. 6871)	9/8/60	To amend title III of the Public Health Service Act, to authorize project grants for graduate training in public health and for other purposes.
87-22	Practical Nurse Training Extension Act of 1961 (S. 278)	4/24/61	To amend title II of the Vocational Education Act of 1946 relating to practical nurses training and for other purposes.
87-415	Manpower Development and Training Act of 1962 (S. 1991)	3/15/62	Relating to manpower requirements, resources, development, and utilization, and for other purposes.
88-129	Health Professions Educational Assistance Act of 1963 (H.R. 12)	9/24/63	To increase the opportunities for training of physicians, dentists, and professional public health personnel, and for other purposes.
88-204	Higher Education Facilities Act of 1963 (H.R. 6143)	12/6/63	To authorize assistance to public and other non-profit institutions of higher education in financing the construction, rehabilitation or improvement of needed academic and related facilities in undergraduate and graduate institutions.

TABLE 10. FEDERAL LEGISLATION TO EXPAND FINANCIAL RESOURCES FOR THE TRAINING OF HEALTH MANPOWER, 1956--1965 (continued)

Public Law	Title	Date	Purpose
88-210	Vocational Education Act of 1963 (H.R. 4955)	12/18/63	To strengthen and improve the quality of vocational education and to expand the vocational education opportunities in the Nation, to extend for three years, the National Defense Education Act of 1958 and Public Laws 815 and 874, Eighty First Congress (federally affected areas), and for other purposes.
88-214	Manpower Development and Training Act of 1962, Amendment (H.R. 8720)	12/19/63	To amend the Manpower Development and Training Act of 1962.
88-452	Economic Opportunity Act of 1964 (S. 2642)	8/20/64	To mobilize the human and financial resources of the Nation to combat poverty in the United States.
88-497	Graduate Public Health Training Amendments of 1964 (H.R. 11083)	8/27/64	To amend the Public Health Service Act to extend the authorization for assistance in the provision of graduate or specialized public health training, and for other purposes.
88-581	Nurse Training Act of 1964 (H.R. 11241)	9/4/64	To amend the Public Health Service Act to increase the opportunities for training professional nursing personnel, and for other purposes.
89-10	Elementary and Secondary Education Act of 1965 (H.R. 2362)	4/11/65	To strengthen and improve educational quality and educational opportunities in the Nation's elementary and secondary schools.
89-15	Manpower Act of 1965 (S. 974)	4/26/65	To amend the Manpower Development and Training Act of 1962, as amended, and for other purposes.
89-73	Older American Act of 1965 (H.R. 3708)	7/14/65	To provide assistance in the development of new or improved programs to help older persons through grants to the States for community planning and services and for training, through research, development or training project grants, and to establish within the Department of Health, Education, and Welfare an operating agency to be designated as the "Administration on Aging."

TABLE 10. FEDERAL LEGISLATION TO EXPAND FINANCIAL RESOURCES FOR THE TRAINING OF HEALTH MANPOWER, 1956--1965
(continued)

Public Law	Title	Date	Purpose
89-97	Social Security Amendments of 1965 (Medicare) H.R. 6675)	7/30/65	To provide a hospital insurance program for the aged under the Social Security Act with a supplementary medical benefits program and an expanded program of medical assistance, to increase benefits under the Old-Age, Survivors, and Disability Insurance, to improve the Federal-State public assistance programs, and for other purposes.
89-105	Mental Retardation Facilities and Community Mental Health Centers Construction Act Amendments of 1965 (H.R. 2985)	8/4/65	To authorize assistance in meeting the initial cost of professional and technical personnel for comprehensive community mental health centers, and for other purposes.
89-109	Community Health Services Extention Amendments of 1965 (S. 510)	8/5/65	To extend and otherwise amend certain expiring provisions of the Public Health Service Act relating to community health services, and for other purposes.
89-115	Health Research Facilities Amendments of 1965 (H.R. 2984)	8/9/65	To amend the Public Health Services Act provisions for construction of health research facilities by extending the expiration date thereof, and providing increased support for the program, to authorize additional Assistant Secretaries in the Department of Health, Education, and Welfare and for other purposes.
89-239	Heart Disease, Cancer and Stroke Amendments of 1965 (S. 596)	10/6/65	To amend the Public Health Service Act to assist in combating heart disease, cancer, stroke, and related diseases through the establishment of regional research, treatment and educational programs.
89-287	National Vocational Student Loan Insurance Act of 1965 (H.R. 7743)	10/22/65	To establish a system of loan insurance and a supplementary system of direct loans, to assist students to attend post-secondary business, trade, technical, and other vocational schools.

TABLE 10. FEDERAL LEGISLATION TO EXPAND FINANCIAL RESOURCES FOR THE TRAINING OF HEALTH MANPOWER. 1956--1965

(continued)

Public Law	Title	Date	Purpose
89-290	Health Professions Educational Assistance Amendments of 1965 (H.R. 3141)	10/22/65	To amend the Public Health Service Act to improve the educational quality of schools of medicine, dentistry, and osteopathy, to authorize grants under that Act to such schools for the awarding of scholarships to needy students, and to extend expiring provisions of that Act for student loans and for aid in construction of teaching facilities for students in such schools and schools for other health professions, and for other purposes.
89-291	Medical Library Assistance Act of 1965 (S. 597)	10/22/65	To amend the Public Health Service Act to provide for a program of grants to assist in meeting the need for adequate medical library services and facilities.
89-329	Higher Education Act of 1965 (H.R. 9567)	11/8/65	To strengthen the educational resources of our colleges and universities and to provide financial assistance for students in post-secondary and higher education.
89-333	Vocational and Technical Rehabilitation Act Amendments of 1965 (H.R. 8310)	11/8/65	To amend the Vocational Rehabilitation Act to assist in providing more flexibility in the financing and administration of state rehabilitation programs, and to assist in the expansion and improvement of services and facilities provided under such programs, particularly for the mentally retarded and other groups representing special vocational rehabilitation problems, and for other purposes.

Note: This list of major legislation enacted during the past decade which is directly or indirectly related to expanded financial resources for training health manpower is adapted from a list prepared for Background Data Book, Department of Labor and Health Education and Welfare Conference on Job Development and Training for Workers in Health Services; U.S. Department of Health, Education, and Welfare; Public Health Service, February 1966 (mimeo).

Until recently, federal aid was limited to training grants for graduate students, including those at the postdoctoral level, in specified specialties. These were available from the U. S. Public Health Service. In addition, a number of postdoctoral career fellowships were provided by both public and private sources. Federal loans for nursing students were provided under the Nurse Training Act of 1964.

Now for the first time, with the passage of the Health Professions Educational Assistance Amendments of 1965, scholarships for medical, dental, and other students in the health professions are available through federal appropriation. This Act marks an important departure in support of education for the health professions. In the view of the majority of this Task Force, the availability of these scholarships for medical students will improve the competitive position of medicine for talented students and will serve to increase recruitment from low income families. In other health professions, where educational facilities can accommodate additional numbers of students, scholarships will serve to increase the total number of students. It is essential that scholarships be broadened to include all professional components of the health team.

A continuing inadequacy in financial support of medical education concerns salaries for interns and residents. Although salaries of house officers have increased in recent years, the average annual starting salary nationally was only $4,037 in 1962-63. For hospitals affiliated with medical schools the average annual starting salary was $3,739, and for nonaffiliated hospitals, $4,309.[31] Such low salaries frequently compel interns and residents to depend on their families for supplemental support. Clearly, salaries of interns and residents should be raised to bring them into line with current standards of independent living.

On the whole, significant strides have been made in providing aid for medical, dental, nursing, and public health education, but continued and expanded support is needed. Just as the Coggeshall Report urged the Association of American Medical Colleges to take leadership in developing the purposes of increased financial support for medical education,[32] so appropriate groups concerned with education for the other health professions and occupations will, it is hoped, take similar leadership on a near-crash basis in proposing measures to meet the financial needs of existing and new schools in these fields.

In view of the attention that has been given by eminent groups to the financing of medical, dental, and nursing education, this Task Force has addressed itself primarily to the financing of education for the allied and auxiliary health occupations. The great need for federal support for these neglected occupations was recognized by the President's Commission on Heart Disease, Cancer and Stroke, which recommended "greatly increased effort and investment in the recruitment and training of health technicians and other paramedical personnel whose skills are essential to the control of heart disease, cancer and stroke"[33] (and, it might be added, to all community health services). A number of measures should be taken to expand and improve educational facilities and to help students to enter these fields:

1. Grants from government and private sources should be expanded to develop programs in two-year colleges for the training of increased numbers of allied and auxiliary personnel in the many health occupations. State and local governments are assuming this obligation with some funds available under the Vocational Education Act,[34] but the financial burden of sound health programs in sufficient numbers will undoubtedly prove too great for state and local resources unless substantial federal aid is provided. The enormous tax base of the federal government, as compared with that of state or local governments, can provide the resources necessary for support of education for allied and auxiliary health personnel, thus far neglected in the understandable emphasis on the main health professions.
2. Federal funds should be made available to universities for the preparation of faculty qualified to teach in health programs in two-year colleges.
3. Scholarships from governmental and private funds, varying with need, should be awarded to students in two-year colleges who wish to prepare for the health occupations. In order to encourage increased numbers of students to undertake preparation for nursing in two-year colleges, some of these scholarships should be earmarked for nursing students.
4. State health departments and other agencies responsible for coordinating manpower activities should inform local communities, school boards, educational authorities, and professional and occupational groups about current programs of assistance to students and institutions for education of health personnel.[35]

In conclusion, a few measures concern financing of education for the health services generally. First, both grants to institutions for operating costs and scholarships to students are needed not only in two-year colleges but at institutions of higher learning providing baccalaureate, graduate, and professional education. The cost of higher education today cannot be met from tuition and fees of students, from endowments, or from local or state governments. Second, a critical need is the preparation of increased numbers of faculty in the health sciences at all educational levels. These faculty members can be produced only if increased fellowship support is provided for graduate education in the biological, physical, and social sciences. Third, awards for study in the health field should be made flexible so that capable students who need to take jobs during their graduate work are eligible for fellowships and traineeships. Of course, every effort should be made to increase the amounts of stipends, taking into account the fact that many graduate students are married and have families, so that students can devote full time to their education. And, fourth, federal grants to educational institutions should be used to correct the wide disparities in resources to support education among the states. Such federal subsidies could go far to improve the quality of higher education in the poorer states.

RECOMMENDATIONS

The Task Force on Health Manpower recommends, as measures to expand and improve education for the health professions and occupations, that:

- Educational programs for the health occupations in two-year colleges be expanded and developed as rapidly as is consistent with quality. (Recommendation 14)
- Current efforts to expand and utilize existing medical and dental schools and to establish new ones be continued and intensified. (Recommendation 15)
- Dental schools assume increased responsibility in the training of auxiliary personnel with broadened functions and promote their use by example. (Recommendation 16)
- Current efforts be intensified to develop nursing education programs that meet the standards required for national accreditation for professional nurses prepared in baccalaureate programs and for technical nurses prepared in two-year colleges or, during an interim period, in hospital diploma programs as well. Other nursing personnel should be prepared in vocational programs. (Recommendation 17)
- Schools of public health revise their programs to meet the emerging needs for health service personnel, with special emphasis on the preparation of personnel qualified in administration. (Recommendation 18)
- Educational institutions provide several programs of education for environmental health personnel--for engineers and scientists, for sanitarians, and for environmental technicians. (Recommendation 19)
- Preparation of specialized personnel in the allied health professions (social workers, clinical psychologists, speech pathologists,

audiologists, rehabilitation counsellors, and others) incorporate instruction and experience in the broad range of health services and participation in the functioning of the health team in the community. (Recommendation 20)

- Innovations and demonstrations be undertaken to develop new methods of preparing personnel of various kinds to staff expanding community programs in mental health and mental retardation. (Recommendation 21)
- Every effort be made by educational institutions, operating agencies, and professional and occupational groups to identify and carry out their individual and mutual responsibilities for inservice training and continuing education. (Recommendation 22)
- Federal support for capital and operating expenses of educational institutions, for research and demonstrations, and for scholarships and fellowships be continued and augmented in such ways as to give maximum stimulation to funding from other sources, including the private sector. (Recommendation 23)

NOTES

(*See Bibliography for detailed annotation)

1. Grant Venn, "Man, Education, and Work, Postsecondary Vocational and Technical Education," p. 87.* See Chapter III, pp. 85-96 for an excellent summary of the diversity of postsecondary school occupational education.

2. *Ibid.*, p. 89.

3. Israel Light, 'The How and Why of Health Careers Program Development,' "Public Health News," p. 131;* (June 1964); Israel Light, 'Training for Health Occupations,' "Junior College Journal;* "American Junior Colleges," 5th Edition.*

4. Data supplied March 17, 1964, by the Bureau of Junior College Education, California State Department of Education. The 12 health curricula for which preparation is offered are: Dental Assisting, Dental Hygiene, Dental Technology, Dietitian Training, Medical Assisting, Medical Laboratory Technology, Nursing-Psychiatric, Nursing-Registered, Nursing-Vocational, Sanitarian Technology, Supervision-Hospital, and X-ray Technology.

5. "Manpower Report of the President and A Report on Manpower Requirements, Resources, Utilization, and Training," p. 72.*

6. Elizabeth D. Robinton, 'Paradoxes of Recruitment and Training of Public Health Laboratory Personnel,' "Health Laboratory Science," 1:4, October 1964, pp. 283-4.

7. Wallace R. Brode, 'Approaching Ceilings in the Supply of Scientific Manpower,' "Science," 143:3604, January 24, 1964, p. 313 at 323-4.

8. Lowell T. Coggeshall, M.D., "Planning for Medical Progress through Education," p. 34.*

9. "Report to the President, A National Program to Conquer Heart Disease, Cancer and Stroke," Vol. I, December 1964, p. 17 and Vol. II, February 1965, p. 281.

10. "Datagrams," 5:8, February 1964.*

11. 'Medical Education in the United States,' "Journal of the American Medical Association," 190:7, November 16, 1964, p. 597 at 613, Table 17.

12. For Full discussion and recommendations re: role of medical schools in training physicians for community health services, see Report of the Task Force on Comprehensive Personal Health Services.

13. B. Duane Moen, 'Survey of Present and Future Needs for Dental Manpower.' p. 10.*

14. See discussion on 'Auxiliary Dental Personnel,' in Chapter III of this Report.

15. "Survey of Dentistry," Chapter II.*

16. For discussion of educational requirements, see "A Position Paper, Educational Preparation for Nurse Practitioners and Assistants to Nurses."*

17. "Toward Quality in Nursing, Needs and Goals," p. 40.*

18. Ibid., p. 16; see also "Facts about Nursing," 1965 Edition, Table 1, p. 9.*

19. Milton I. Roemer, M.D., 'The Nonmedical Health Administrator: His Training and Value,' "California's Health," 21:15, February 1, 1964, p. 113 at 114. For a discussion of training programs in medical care administration, see Milton I. Roemer, M.D., "Medical Care Administration: Content, Positions, and Training in the United States," Chapter V.*

20. "Report of the Committee on Environmental Health Problems to the Surgeon General," pp. 39-40.*

21. Ibid., p. 40.

22. See "Report of a Conference on Education Needs in Environmental Health."* A national environmental health center is being developed in North Carolina, a center that will function similarly to the Robert A. Taft Sanitary Engineering Center in Ohio.

23. J. Sprowls and G. Griffenhagen, 'The Pharmacy: What Better Agency,' "International Journal of Health Education," Vol. 6, July-September 1963, p. 187; see also J. Sprowls, 'The Role of the Pharmacist as a Public Health Consultant.'*

24. "The Heart and Circulation," p. 893.*

25. William W. Stiles and Shirley Cooper, 'Public Health in the Pharmaceutical Curriculum,' "American Journal of Pharmaceutical Education," 24:2, Spring, 1960, p. 204.

26. "Dietitians and Nutritionists."*

27. Roslyn B. Alfin-Slater, Ph.D., 'Education of the Allied Health Professions,' "The Heart and Circulation," p. 887 at 888.*

28. "Public Health Concepts in Social Work Education," proceedings of Seminar on Public Health for Schools of Social Work, Council on Social Work Education, New York, 1962; Western Conference on Public Health Concepts in Social Work Education, held in Berkeley, California, June 1965, publication of proceedings pending.

29. "Pilot Project in Training Mental Health Counselors";* see also Darrel J. Mase, Ph.D., 'Manpower Utilization for the Future,' "Journal of Rehabilitation," January-February, 1964.

30. "Continuing Education Program," p. 2.*

31. 'Medical Education in the United States,' "Journal of the American Medical Association," 190:7, November 16, 1964, pp. 597-631.

32. Lowell T. Coggeshall, M.D., "Planning for Medical Progress through Education," p. 147.*

33. "A National Program to Conquer Heart Disease, Cancer and Stroke," Washington, D.C., December 1964, Vol. I, p. 60.

34. Applications for funds under the Vocational Education Act and requests for information should be sent to:

Bureau of Adult and Vocational Education
Office of Education
U.S. Department of Health, Education, and Welfare
Washington, D.C. 20202

35. Digests of legislation and other pertinent information are published by the Office of Program Analysis of the Department of Health, Education, and Welfare.

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